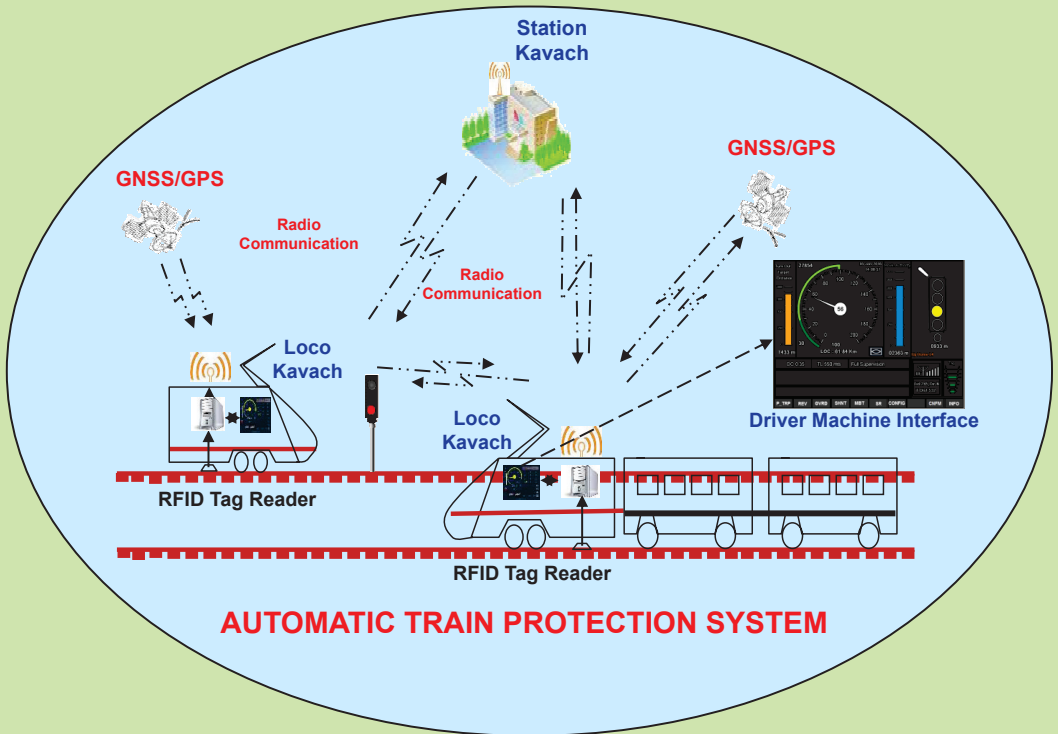




INDIAN RAILWAYS YEAR BOOK 2021 - 22

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Azadi Ka
Amrit Mahotsav



Bharat Sarkar
Government of India
Rail Mantralaya
Ministry of Railways
(Railway Board)



INDIAN RAILWAYS



YEAR BOOK 2021-22



**BHARAT SARKAR
GOVERNMENT OF INDIA
RAIL MANTRALAYA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)**

Contents

1.	Key Statistics	3
2.	Other Important Statistics	4
3.	Some Selected Financial Ratio	7
4.	Economic Review	9
5.	Planning	19
6.	Passenger Business	22
7.	Freight Operations	38
8.	Asset Utilisation	46
9.	Safety	52
10.	The Network	61
11.	Track and Bridges	64
12.	Electrification	73
13.	Signal and Telecom	79
14.	Rolling Stock	85
15.	Traction	91
16.	Personnel	96
17.	Finance	108
18.	Social Service Obligation	112
19.	Research and Development	116
20.	Undertakings and other Organisations	123
21.	Self-Sufficiency	157
22.	Materials Management	161
23.	Security	165
24.	Vigilance	172
25.	Preserving IR's Heritage	174

Key Statistics

	Unit	2020-21	2021-22
PLANT & EQUIPMENT:			
Capital Investment (incl. Capital Fund)	₹ in crore	#3,87,689.69	@4,66,718.71
Total Investment	"	6,70,725.78	8,09,918.59
Route Length	Kms.	68,103	68,043
Locomotives	Nos.	12,734	13,215
Passenger Service Vehicles	"	*71,734	74,744
Other Coaching Vehicles	"	*7,949	10,103
Wagons	"	*3,02,663	3,18,896
Railway Stations	"	7,337	7,308
OPERATION:			
Passenger: Train kms.	Millions	245	582
Vehicle kms.	"	*8,058	18,866
Freight: Train kms.	"	418	481
Wagon kms.	"	*19,021	22,116
VOLUME OF TRAFFIC:			
Passengers Originating	Millions	1,250	3,519
Passenger kms.	"	2,31,126	5,90,217
Tonnes Originating:\$			
Revenue Earning Traffic	"	1,230.94	1,415.87
Total Traffic (incl. non-revenue)	"	1,233.85	1,418.84
Net Tonne kms.\$			
Revenue Earning Traffic	"	7,19,762	8,71,816
Total Traffic (incl. non-revenue)	"	7,20,054	8,72,112
EMPLOYMENT AND WAGES:			
Regular Employees	Thousands	*1,243	1,213
Wage Bill of Regular Employees	₹ in crore	*1,39,818.25	1,51,754.02
Average Annual Wage Per Regular Employee	₹ in units	*11,24,418	12,51,004
FINANCIAL RESULTS:			
Revenue	₹ in crore	1,40,570.52	1,91,206.48
Expenses	"	1,36,567.51	2,04,606.34
Miscellaneous Transactions	"	(-)1,455.63	(-)1,624.72
Net Revenue (before dividend)	"	2,547.48	(-)15,024.58
Rate of Return on Capital	Percent	0.66	(-)3.22
Dividend on Capital **	₹ in crore	0.00	0.00
Shortfall(-)/Excess(+)	"	2,547.48	(-)15,024.58
@ Includes investment (₹ 53,449.91 crore) from Capital Fund.			
# Includes investment (₹ 53,449.91 crore) from Capital Fund.			
\$ Excludes Konkan Railway.			
* revised			
** No dividend was payable during 2020-21 & 2021-22.			

Other Important Statistics

S.No.	Item	Unit	2020-21	2021-22
I	Rail Network			
1	Route Kilometres			
	(i) BG	Kms.	64,403	65,093
	(ii) MG	"	2,112	1,655
	(iii) NG	"	1,588	1,294
	(iv) Total (all gauges)	"	68,103	68,043
2	Running Track Kilometres (Total all gauges)	"	1,00,866	1,02,831
3	Total Track Kilometres (Total all gauges)	"	1,26,611	1,28,305
4	Electrified Route Kilometre (Total all gauges)	"	44,802	50,394
II	Rolling stock			
1	Number of Locomotives	(in units)		
	(i) Steam	"	39	39
	(ii) Diesel	"	5,108	4,747
	(iii) Electric	"	7,587	8,429
	(iv) Total	"	12,734	13,215
2	Number of Wagons	"	3,02,624	3,18,896
3	Number of Coaches-	(in units)		
	(i) Passenger Carriages (including DEMU/ DHMU)	"	*60,743	62,971
	(ii) Other Coaching Vehicles	"	*7,949	10,103
	(iii) EMU and MEMU Coaches	"	10,991	11,773
	(iv) Rail Cars	"	*18	16
	(v) Total	"	*79,701	84,863
III	Loco Utilisation			
1	Tractive effort per loco			
	(i) BG	Kgs.	39,911	40,553
	(ii) MG	"	16,439	16,053
2	GTKMs (excl. wt. of engine & dept.) per kg. of tractive effort.			
	(i) BG	Kms.	2,713	3,697
	(ii) MG	"	*32	165
3	Engine kilometres per day per engine in use (Pass.) (B.G)			
	(i) Diesel	Kms.	*493	703
	(ii) Electric	"	*678	747

S.No.	Item	Unit	2020-21	2021-22
4	Engine kilometres per day per engine in use (Goods)(B.G)			
	(i) Diesel	Kms.	420	484
	(ii) Electric	"	*526	445
5	NTKMs per engine hour (BG) All traction		*13,693	14,520
6	Ineffective percentage of locomotives (B.G)	Percent		
	(i) Diesel	"	9.77	9.79
	(ii) Electric	"	7.35	5.85
IV	Wagon Utilisation			
1	Wagon KMs in terms of 8 wheelers	Million	*19,021	22,116
2	Total Carrying Capacity (All Gauges)	Million Tonnes	17.82	18.53
3	Average carrying capacity - wagon	Tonnes		
	BG	"	62.27	61.75
	MG	"	*33.21	32.44
4	Wagon Turn Round (in days) (BG)	Days	5.43	4.74
5	Wagon Kms. per wagon per day (BG)	Kms	*170.1	211.8
6	NTKMs per wagon per day (BG)	Kms	6,861	8,384
7	Ineffective percentage of wagons (B.G)	%age	4.52	3.52
V	Coach Utilisation			
1	Vehicle Kms.(Excluding Deptt./Rail Car etc.)	Millions		
	(i) Suburban (EMU)	"	880	1,731
	(ii) Non Suburban	"	*7,178	17,382
	(iii) Total	"	*8,058	19,113
2	Vehicle Kms per vehicle day (B.G)	Kms.	185	411
3	Ineffective percentage of coaches(B.G) (Passenger Carriage)	Percent	6.17	5.68
VI	Train Utilisation			
a.	Passenger Train Performance			
1	Number of Passenger trains runs daily	Nos.	2,140	10,250
2	Passenger Train Kms	Millions	245	582
b.	Goods Train Performance			
1	Number of Goods trains runs daily	Nos.	8,021	9,164
2	Goods Train Kms.	Millions	418	481
3	Average Speed of All Goods Train (B.G.)			
	(i) Diesel	Kms/ Hour	40.6	36.5
	(ii) Electric	"	45.8	38.1
	(iii) All Traction	"	43.2	37.8
4	Average Net load of Goods train (B.G) (All traction)	Tonnes	1,738	1,817
5	Average Gross load of Goods train (B.G) (All traction)	Tonnes	2,925	3,094

S.No.	Item	Unit	2020-21	2021-22
VII	Volume of traffic			
a.	Passenger Traffic (Suburban + Non-Suburban)			
1	Passenger Originating	Millions	1,250	3,519
2	Passenger Kilometres	Millions	2,31,126	5,90,217
3	Average Lead	Kms.	184.8	167.7
4	Passenger Earnings	₹ in crore	15,248.49	39,214.39
5	Average rate per PKMs	Paise	65.97	66.44
6	Number of Passenger carried per day	Millions	3.42	9.64
b.	Freight Traffic (Revenue)			
1	Tonnes originating	Millions	1,230.94	1,415.87
2	Lead (originating)	Kms.	585	616
3	Freight Earnings excl. Demurrage/Wharfage	₹ in crore	1,15,738.38	1,39,287.30
4	Freight NTKMs	Millions	7,19,762	8,71,816
5	Average rate per NTKMs	Paise	160.80	159.77
6	Earnings per million tonne	₹ in crore	94.02	98.37
7	Freight carried per day (including non-revenue)	Millions Tonnes	3.38	3.88
VIII	Train Accidents (Excl. KRCL)	Nos.	21	34
1	Collisions	"	*1	2
2	Derailment	"	16	26
3	Level Crossing	"	1	1
4	Fire in trains	"	3	4
5	Miscellaneous		0	1
6	Accident per million train Kms		0.03	0.03
IX	Density			
1	Net Tonne Kms per route Km. (BG)	Km.	11.18	13.40
2	Passenger Kms per route Km. (BG)	"	3.59	9.60
3	Gross Tonne Kms per route Km. (BG)	"	23.17	33.50
X	Consumption of Fuel/Energy by Locomotive			
(i)	Diesel	Million litres	*1,131.20	1,462.38
(ii)	Electric	Million KWH	14,092.42	21,700.58
	* revised			

Some Selected Financial Ratio

S. No.	Item	Unit	2020-21	2021-22
(A) Financial Ratios				
1.	Operating ratio	% age	97.45	107.39
2.	Rate of return on Capital	% age	0.66	(-) 3.22
3.	Working ratio of IR	% age	88.5	99.70
4.	Operating ratio with subsidy (Cost recovery)	% age	65.9*	81.1
5.	Operating ratio for Coaching (passenger) and Goods (Freight)			
	i. Goods	% age	83.20	72.88
	ii. Coaching	% age	454.68	237.38
6.	Debt Servicing as percentage of OWE and as a percentage of Gross receipts.			
	i. Debt servicing as percentage of OWE	% age	17.6	18.2
	ii. Debt servicing as percentage of Gross Receipts	% age	17.0	14.9
7.	Capex to Revenue ratio – Capex (from internal generation) /Revenue	% age	1.5	0.9
(B) Earning/Yield Ratios (Based on Apportion Earning)				
8.	Passenger yield/ PKMs	In Paise	65.97	66.44
9.	Fright yield/NTKMs	In Paise	160.80	159.77
	Productivity index			
	i. Employee Productivity		5,94,618*	7,59,187
	ii. Infrastructure Productivity		58,36,345*	71,76,680
(C) Asset Utilization				
10.	Utilization of Assets			
	i. NTKMs per wagon per day -(BG)	KMs	6,861	8,384
	ii. Wagon KMs per Wagon day -(BG)	KMs	170.1*	211.8
	iii. Wagon turn around - BG	In days	5.43	4.74
	iv. Average Load per Wagon - BG	Tonnes	68.8	62.9
(D) Operating Indices				
11.	Average speed of Goods Train – (BG) – All traction	KM/hour	43.2	37.8
12.	Infective percentage of Rolling Stock – (BG)			
	i. Diesel Locos	% age	9.77	9.79
	ii. Electric Locos	% Age	7.35	5.85

S. No.	Item	Unit	2020-21	2021-22
	iii. EMU Coaches	% age	10.0	10.4
	iv. Passenger Carriages	% age	6.17	5.68
	v. Other Coaching Vehicles	% age	5.22	5.55
	vi. Wagons	% age	4.52	3.13
13.	Specific Fuel Consumption (Consumption per 1000 GTKMs) – (BG)			
	i. Passenger service Diesel	Litress.	3.31	3.33
	ii. Goods services Diesel	Litress.	1.92	1.75
14.	Specific Energy Consumption (Consumption per 1000 GTKMs) – (BG)			
	i. Passenger service- Electricity	KWt. Hrs.	15.6	21.6
	ii. Goods services -Electricity	KWt. Hrs.	7.09	7.29
15.	Punctuality Index – Punctuality (M/Exp. Trains) –(BG)	% age	94.17	90.48
16.	Accident per Million Train Kilometers		0.03	0.03

*Revised



*A coal laden goods train in the doubling completed section
between Omalur-Mecheri Road, SR*

Economic Review

Macroeconomic outcome

Whilst the V-shaped recovery of the Indian economy in Q4 of 2020-21 was expected to continue in the ensuing year 2021-22, a health crisis interrupted its momentum during Q1 of the year as the second wave of the pandemic emerged. Nevertheless, the Indian economy exhibited resilience and real GDP bounced back in Q2 of 2021-22 with growth at 1.5 per cent over Q2 of pre-pandemic year 2019-20. The recovery was further entrenched in Q3 of 2021-22 with GDP exceeding the corresponding pre-pandemic quarter by 6.6 per cent. In Q4, the outlook became grim due to the arrival of Omicron variant and the presence of geopolitical conflict. Otherwise, the Indian economy consolidated itself in 2021-22 with most of its constituents recovering over the pre-pandemic year. The agricultural sector provided a cushion to the economy throughout the year. An upward thrust to aggregate demand was induced by an acceleration of Government consumption expenditure. Government prioritized capital expenditure and subsequent increase in public investment enabled the gross fixed capital formation to rebound sharply. A robust recovery in tax revenues helped contain the gross fiscal deficit close to budgetary targets. The sustained strength of exports and revival in inbound remittances underpinned the viability of the balance of payments, with net capital flows also contributing to the accretion to foreign exchange reserves.

According to the International Monetary Fund (IMF) - World Economic Outlook of April 2022, world GDP expanded by 6.1 per cent in 2021 as against a contraction of 3.1 per cent in the previous year and was expected to slow down to 3.6 per cent in 2022 and 2023. After 2023 it forecasts GDP growth to decline to about 3.3 per cent over the medium term with the assumption that global conflict remains confined to Ukraine and the health and economic impacts due to pandemic, will decline during 2022. However, down-side risks to the global outlook dominate which include the possible worsening of the war and sharper than anticipated deceleration of growth in China. Higher food and energy prices would also weigh on the outlook. Scarring effects are expected more in emerging markets and developing economies than in advanced economies.

Gross Domestic Product (GDP) Growth: India

GDP at constant (2011-12) prices or real GDP in the year 2021-22 was estimated at ₹147.36 lakh crore, as against the real GDP of ₹135.58 lakh crore for the year 2020-21. The year-on-year growth rate in real GDP during 2021-22 was up at 8.7 per cent from a contraction of (-) 6.6 per cent in 2020-21. Consequently, the GDP level surpassed the pre-pandemic level of 2019-20 by 5.0 per cent (Table 1).

Table 1: GDP and GVA at constant price 2011-12 (In ₹ Crore)

	2017-18	2018-19 3rd RE	2019-20 2nd RE	2020-21 1st RE	2021-22 PE
GDP at constant price	13144582 (6.8)	13992914 (6.5)	14515958 (3.7)	13558473 (-6.6)	14735515 (8.7)
GVA at basic price	12034171 (6.2)	12733798 (5.8)	13219476 (3.8)	12585074 (-4.8)	13605474 (8.1)

Source: National Statistical Office (NSO), Ministry of Statistics and Programme Implementation, Press release dated 31st May 2022.

PE: Provisional Estimate

RE: Revised Estimate

Note: Growth rate over previous year indicated in brackets.

Real Gross Value Added (GVA), which reflects the production or supply side method of calculating GDP for 2021-22 at basic constant (2011-12) prices, is estimated at ₹136.05 lakh crore (Provisional Estimates) in comparison with ₹125.85 lakh crore (First Revised Estimate) for the year 2020-21, thus registering a year-on-year growth rate of 8.1 per cent in 2021-22 as against contraction of (-)4.8 per cent in the year 2020-21 (Table 1).

The increase in GVA in 2021-22 compared to the previous year was attributed to faster growth in all sectors except for Agriculture, Forestry and Fishing. All the other sectors registered an expansion in the growth rate in GVA in 2021-22(PE) at constant (2011-12) prices over the previous year. Under the category Industry, the leading sectors were Mining & Quarrying(11.5 per cent) and Construction (11.5 per cent) followed by Manufacturing (9.9 per cent) and Electricity (7.5 per cent). The Services sector growth was led by Public Administration, Defence and other services(12.6 per cent) Trade, Hotels, Transport, Communication and services related to Broadcasting(11.1 per cent) followed by Financial, Real Estate & Professional Services (4.2 per cent). All the sectors in Industry surpassed the pre-pandemic levels of 2019-20 and Services sector followed suit excepting for its financial component. Growth rate of agriculture underwent a contraction vis-à-vis the pre-pandemic levels (Table 2)

Table 2: Sector-wise Growth in GVA at Basic Prices (%) at 2011-12 prices

	2019-20 (2nd RE)	2020-21 (1st RE)	2021-22 (PE)
I. Agriculture, Forestry & Fishing	5.5	3.3	3.0
II. Industry			
Mining & Quarrying	(-)1.5	(-)8.6	11.5
Manufacturing	(-)2.9	(-)0.6	9.9
Electricity, Gas, Water Supply & other utility services	2.2	(-)3.6	7.5
Construction	1.2	(-)7.3	11.5
III. Services			
Trade, Hotels, Transport, Communication and services related to broadcasting	5.9	(-)20.2	11.1
Financing, Real Estate & Professional Services	6.7	2.2	4.2
Public Administration, defence and other services	6.3	(-)5.5	12.6
GVA at Basic Price	3.8	(-)4.8	8.1

Source: National Statistical Office (NSO), Press release dated 31st May, 2022.

PE: Provisional Estimates.

Agriculture

As per the Fourth Advance Estimates of Production of Foodgrains for 2021-22, the foodgrain production in 2021-22 is at 315.72 million tonnes. This is higher by 4.98 million tonnes as compared to 310.74 million tonnes during 2020-21. The components of foodgrains, mainly rice and pulses registered an increase in production in 2021-22 over the previous year, while wheat and coarse cereals registered a decrease in production (Table 3).

Table 3: Production of selected agricultural commodities (million tonnes)

Items	2017-18	2018-19	2019-20	2020-21	2021-22
Food grains	285.01	285.21	297.50	310.74	315.72
Wheat	99.87	103.60	107.86	109.59	106.84
Rice	112.76	116.48	118.87	124.37	130.29
Coarse Cereals	46.97	43.06	47.75	51.32	50.90
Pulses	25.42	22.08	23.03	25.46	27.69

Source: Department of Agriculture and Farmers Welfare, Fourth Advance Estimates of Production of Foodgrains for 2021-22 as on 17.08.2022.

Industry

As per the national accounts data of the NSO, the Index of Industrial Production (IIP), which broadly comprises of mining, manufacturing and electricity, increased to 11.4 per cent in 2021-22 compared to the previous year's growth rate of (-)8.4 per cent in 2020-21. The easing of mobility

restrictions helped the index to recover and even overcome the contraction that started in 2019-20. This is attributed to a higher growth rate witnessed in all the components of the IIP. The growth rate of mining sector which was (-)7.8 per cent in 2020-21 increased to 12.2 per cent 2021-22, manufacturing sector increased from (-)9.6 per cent in 2020-21 to 11.8 per cent in 2021-22 and in the electricity group, the annual growth rate was 7.9 per cent in 2021-22 compared to that of (-)0.5 percent in 2020-21 (Table 4).

Table 4: Sectoral Growth Rates of Industrial Sector based on Index of Industrial Production (%)

(Base: 2011-12 = 100)

Industry Group	Weight	2017-18	2018-19	2019-20	2020-21	2021-22
General Index	100.00	4.4	3.8	(-)0.8	(-)8.4	11.4
Mining	14.3725	2.3	2.9	1.6	(-)7.8	12.2
Manufacturing	77.6332	4.6	3.9	(-)1.4	(-)9.6	11.8
Electricity	7.99432	5.4	5.2	1.0	(-)0.5	7.9

Source: National Statistical Office (NSO), Ministry of Statistics and Programme Implementation, Press release dated 11th June, 2021.

Note: Growth is over the corresponding period of previous year.

In terms of use-based classification, the annual growth rate of IIP for Primary goods increased to 9.7 per cent in 2021-22 from (-) 7.0 per cent in 2020-21. Annual Growth rate of IIP for Capital goods increased from (-) 18.6 per cent in 2020-21 to 17 per cent in the year 2021-22. Intermediate goods witnessed a growth rate of 15.4 per cent in 2021-22 as against (-) 9.4 per cent in 2020-21. Growth rate of Infrastructure/construction goods was 18.9 per cent in 2021-22 as against (-) 8.7 per cent in 2020-21. Consumer durable goods was 12.5 per cent in 2021-22 as against (-) 15.0 per cent in 2020-21. For Consumer non-durables, growth rate was 3.3 per cent in 2021-22 as against (-) 2.2 per cent in 2020-21.

Infrastructure Industries

The index of 8 core infrastructure supportive industries (comprising coal, crude oil, natural gas, petroleum refinery products, fertilizers, finished carbon steel, cement and electricity) comprising weight of 40.27 per cent in the weight of items included in IIP witnessed a growth rate of 10.4 percent in 2021-22 compared to (-)6.4 per cent in 2020.21. Cement, Natural Gas and Steel registering annual growth rates of 20.8 per cent, 19.2 per cent and 17 per cent respectively were the best performing infrastructure industries in 2021-22. Refinery products, Coal and Electricity also improved the performance with growth rate of 8.9 per cent, 8.5 per cent and 8.0 per cent, respectively. Growth rate of Fertilizers was only 0.7 per cent in the year 2021-22 as compared to that of 1.7 per cent in the year 2020-21. The

annual growth rate of crude oil in 2021-22 at (-) 2.6 per cent improved from (-) 5.2 per cent in the previous year (Table 5).

Table 5: Growth (%) in Index of Eight Core Industries (Base: 2011-12=100)

Sectors	Weight	2017-18	2018-19	2019-20	2020-21	2021-22
Coal	10.3335	2.6	7.4	(-)0.4	(-)1.9	8.5
Crude oil	8.9833	(-)0.9	(-)4.1	(-)5.9	(-)5.2	(-)2.6
Natural Gas	6.8768	2.9	0.8	(-)5.6	(-)8.2	19.2
Refinery Products	28.0376	4.6	3.1	0.2	(-)11.2	8.9
Fertilizers	2.6276	0.03	0.3	2.7	1.7	0.7
Steel	17.9166	5.6	5.1	3.4	(-)8.7	17.1
Cement	5.3720	6.3	13.3	(-)0.9	(-)10.8	20.8
Electricity	19.8530	5.3	5.2	0.9	(-)0.5	8.0
Overall	100.0000	4.3	4.4	0.4	(-)6.4	10.4

Source: Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade, Press release dated 31st May 2022.

Fiscal Outcome

The major fiscal indicators of the Central Government are presented in Table 6. Comparison of Budget Estimates of expenditure in 2021-22 over 2020-21(PA) suggests that Central Government's total expenditure is expected to decrease by 2.2 percentage point of GDP in 2021-22 over the previous year. Major decrease of 2.5 per cent is visible on revenue account with capital spending increasing by 0.3 per cent of GDP. Within revenue expenditure, nearly 2 per cent of the decrease is explained by the decrease in major subsidies. Gross tax revenues continued to be buoyant in the face of the pandemic in 2020-21 but estimated to decline by 0.4 per cent of GDP in 2021-22. Gross fiscal deficit budgeted at 6.8 per cent of GDP in 2021-22 is expected to be consolidated by 2.4 percent of GDP compared to the previous year.

Table 6: Components of Revenue and Expenditure of the Central Government (as percent to GDP)

	2017-18	2018-19	2019-20	2020-21 (PA)	2021-22 (BE)
Revenue Receipts	8.4	8.2	8.3	8.3	8.0
Gross Tax Revenue	11.2	11.0	9.9	10.3	9.9
Total Expenditure	12.5	12.3	13.2	17.8	15.6
Revenue Expenditure	11.0	10.6	11.6	15.6	13.1
Capital Expenditure	1.5	1.6	1.6	2.2	2.5
Interest payment	3.1	3.1	3.0	3.5	3.6
Major subsidies	1.1	1.0	1.1	3.5	1.5
Revenue Deficit	2.6	2.4	3.3	7.4	5.1
Fiscal Deficit	3.5	3.4	4.6	9.2	6.8
Primary Deficit	0.4	0.4	1.6	5.8	3.1

Source: Economic Survey, 2021-22.

PA: Provisional Actuals, BE: Budget Estimates

Inflation

Wholesale Price Index (WPI) for all commodities averaged 1.31 per cent in 2020-21 rose sharply to 12.97 per cent in 2021-22. This was mainly on account of the fuel inflation, which increased sharply from (-) 8.02 per cent in 2020-21 to 32.55 per cent in 2021-22 combined with an increase in the inflation for primary articles from 1.67 per cent in 2020-21 to 10.30 per cent in 2021-22 and that of manufactured products from 2.70 per cent in 2020-21 to 11.11 per cent in 2021-22 (Table 7).

Table 7: Annual Inflation rate (%) based on WPI (Base 2011-12=100)

Items/Groups	Weight (%)	April-March (Average)	
		2020-21	2021-22
All Commodities	100	1.31	12.97
Primary articles	22.61756	1.67	10.30
Fuel and Power Group	13.15190	(-)8.02	32.55
Manufactured Products	64.23054	2.70	11.11

Source: Estimated from base data released by the Office of the Economic Adviser, Department for Promotion of Industry and Internal Trade

Supply disruptions on account of lockdowns caused the WPI to rise toward the latter part of the first quarter. It began to ease by September but the track was interrupted during the last quarter of the year by the elevated commodity prices resulting from Ukraine-Russia conflict and the supply bottlenecks, which led to a rise beyond 6 per cent.

Inflation measured in terms of Consumer Price Index (CPI, Base 2012=100, rural and urban combined) averaged 5.5 per cent in 2021-22 as against 6.2 per cent in 2020-21 and 4.8 per cent in 2019-20.

CPI inflation had eased to 4.2 per cent in April 2021, before the second wave of COVID-19 led to supply disruptions. Localised lockdowns and transmission of increase in global commodity prices (crude oil and metals) led to a sharp and broad-based pick up in headline inflation during May-June 2021. Inflation eased thereafter with moderation in food prices aided by the easing of curbs and favourable base effects. Inflation began picking up again from October 2021

External Sector

Foreign Trade

Exports in the year 2021-22 grew by 5.03 per cent over the previous year, as compared to (-) 7.53 per cent in 2020-21. Imports witnessed a higher annual growth rate of 12.14 per cent in 2021-22 as against (-) 16.63 per cent in 2020-21. The trade balance, accordingly, which was at US\$ (-) 102.15 billion in 2020-21 increased to US\$ (-) 135.64 billion in 2021-22 but it was lower as compared to the 2019-20 levels (Table 8 and 9).

According to the RBI (Bulletin, June 2022) the oil exports registered an annual growth rate of 163.71 per cent as against (-) 40.23 per cent in 2020-21 and (-) 7.79 per cent in 2019-20. The non-oil exports witnessed a growth rate of 33.62 per cent during the year 2021-22 as against (-) 2.32 per cent in the previous year and (-) 4.10 per cent in 2019-20. The growth rate of oil imports at 95.40 per cent also improved in 2021-22 compared to the previous years' growth rate of (-) 36.12 per cent and (-) 8.13 per cent in 2019-20. The non-oil imports also improved in 2021-22 by 44.88 per cent as against a growth rate of (-) 7.95 per cent in the previous year and a growth rate of (-) 9.25 percent in 2019-20.

Table 8: Export, Import and Trade Deficit (in US \$ billion)

Item	2020-2021	Growth* (%)	2021-2022	Growth* (%)
Exports	296.30	(-)7.53	311.19	5.03
Imports	398.45	(-)16.63	446.84	12.14
Trade Balance#	(-)102.15		(-)135.64	

Source: RBI Annual report 2021-22 dated May 27 2022.

Exports minus Imports

*Over the previous year

Current Account Deficit (CAD)

Table 9: Current Account Balance (in US \$ billion)

Year	2017-18	2018-19	2019-20	2020-21	2021-22
Trade Balance	(-)160.04	(-)180.28	(-)157.51	(-)102.15	(-)135.64
Net Invisibles	111.32	123.03	132.85	126.07	109.08
Current Account Balance	(-)48.72	(-)57.26	(-)24.66	23.91	(-)26.57
Current Account Balance as a Ratio to GDP (%)	(-)1.8	(-)2.1	(-)0.9	0.9	(-)1.2

Source: RBI Annual Report dated 27th May 2022.

Foreign Capital Inflows

Net foreign direct investments (FDI) increased from US\$ 30.71 billion in 2018-19 to US\$ 43.96 billion in 2020-21 and then declined to US\$ 26.51 billion in 2021-22. Net Portfolio investment increased to US\$ 36.14 billion in 2020-21, as compared to US\$ (-) 0.62 billion in the year 2018-19 and then declined to US\$ (-) 1.56 billion in 2021-22 (Table 10).

During the year, policy norms for FDI in select sectors, including pension fund management companies, oil and gas PSUs and telecom services, were further eased. Financial, insurance and business services, manufacturing, wholesale and retail trade, and restaurants and hotels were the major sectors attracting India's overseas direct investment during the year. In contrast to FDI flows, net foreign portfolio investment (FPI) flows ebbed after record net inflows in 2020-21.

Table 10: Net Foreign Direct Investment (FDI) and Net Portfolio Investment
(In US\$ billion)

Years	Net FDI	Net Portfolio Investment
2017-18	30.29	22.12
2018-19	30.71	(-)0.62
2019-20	43.01	1.4
2020-2021	43.96	36.14
2021-22(P)	26.51	(-)1.56

Source: RBI Annual Report dated 27th May, 2022.

(P): Provisional

Foreign Exchange Reserves & Exchange rate

Foreign exchange reserves of US\$ 607.3 billion at end-March 2022 provided cover of 10 months of imports projected for 2022-23 in comparison with the reserves of US\$ 576.98 billion at the end of the previous year. Foreign exchange reserves in 2021-22 were bolstered by the IMF's general SDR allocations of SDR 12.57 billion to India in August 2021.

Major commodities carried by Indian Railways

The following table shows the percentage of total production plus imports of some of the major commodities carried by the Indian Railways during the last 5 years.

Table 11: Percentage of total production plus imports of select major commodities carried by the Indian Railways

	Coal	Iron Ore	Cement	Foodgrains	Fertilizers	PoL products
2017-18	62.83	66.53	37.43	14.97	85.46	14.87
2018-19	62.84	62.63	34.55	13.65	86.05	14.54
2019-20	59.92	62.52	32.71	12.47	84.23	14.57
2020-21(R)	58.18	77.53	39.83	20.05	84.44	15.35
2021-22(P)	66.19	64.50	38.25	23.04	80.03	15.20

(P): Provisional (R): Revised

Source: Production and import data received from various Central Ministries/ Departments and railway loading data received from Directorate of Statistics and Economics, Ministry of Railways.

Selected Economic Indicators

The trends for the last five years (2017-18 to 2021-22) in some of the economic indices like Net National Income, Per Capita Income, Capital formation in Railways, Value of Foreign Trade, Indices of Agricultural Production, Wholesale Price Index (WPI) of commodities, WPI of important commodities used by Railways and Consumer Price Index for Industrial Workers are given below in Table 12.

Table 12: SELECTED ECONOMIC INDICATORS

ITEM	Unit / Base	2017-18	2018-19 3rd RE	2019-20 2nd RE	2020-21 1st RE	2021-22 (PE)
I. (a) Net National Income						
(i) At 2011-12 prices	₹ Crore	11508774	12226019	12641633	11536004	12519976
(ii) At current prices	₹ Crore	15140418	16713054	17716597	17194158	20529727
(b) Per capita income						
(i) At 2011-12 prices	(In ₹)	87586	92133	94270	85110	91481
(ii) At current prices	(In ₹)	115224	125946	132115	126855	150007
II. Gross Capital Formation						
Railways						
(i) At 2011-12 prices	₹Crore	69665	73028	74549	44220	NA
(ii) At current prices	₹Crore	83720	90369	96246	58747	NA
III. Foreign Trade:						
(a) Value of exports	₹Crore	1956515	2307726	2219854	2159043	3147021
Value of imports	₹Crore	3001033	3594675	3360954	2915958	4572775
(b) Value of exports	US \$	303526	330078	313361	291808	422004
Value of imports	US \$	465581	514078	474709	394436	613052
	Million					

Source: Ministry of Commerce and Industry, Department of Commerce, Export import data Bank dated 04.08.2022

IV. Index of Agricultural Production (Triennium ending 2007-08 =100)

	Weight	2017-18	2018-19	2019-20	2020-21	2021-22
(a) All Crops	(100.00)	139.4	138.1	145.5	139.0	143.3
(b) Foodgrains	(50.7)	136.8	134.4	139.8	142.0	144.2
(c) Non-foodgrains	(49.3)	142.1	142.0	151.3	137.7	142.9

Source: Handbook of Statistics (2020-21), Reserve Bank of India

V. Index of Industrial Production (2011-12=100)(Cumulative Index -April - March)

	Weight	2017-18	2018-19	2019-20	2020-21	2021-22
(a) General Index	(100.0)	125.3	130.1	129.0	118.1	131.6
(b) Mining	(14.3725)	104.9	107.9	109.6	101.0	113.3
(c) Manufacturing	(77.6332)	126.6	131.5	129.6	117.2	131.0
(d) Electricity	(7.9943)	149.2	156.9	158.4	157.6	170.1

Source: NSO, Ministry of Statistics and Programme Implementation, Press release dated 11th June, 2021 for 2019-20 and 2020-21.

VI. Wholesale Price Index (Financial Year Average with weights) (Base 2011-12=100)

	Weight	2017-18	2018-19	2019-20	2020-21	2021-22
(a) All Commodities	(100.00)	114.9	119.8	121.8	123.4	139.4
(b) Primary Articles	(22.62)	130.6	134.2	143.3	145.7	160.7
(c) Fuel & Power	(13.15)	93.3	104.1	102.2	94.0	124.6
(d) Manufactured Products	(64.23)	113.8	117.9	118.3	121.5	135.0

VII. Wholesale Price Indices of Important Commodities used by Railways

(a) Non-coking coal	(1.40)	112.5	119.0	119.0	119.3	119.8
(b) Minerals Oils	(7.95)	82.5	96.7	92.3	79.2	126.2
(c) Electricity	(3.06)	103.7	109.6	111.8	109.6	117.4
(d) Manufacture of Basic Metals	(9.65)	101.4	112.2	106.2	111.4	140.1
(i) Inputs into Steel Making	(1.41)	98.2	113.0	100.6	109.2	150.8
(ii) Ferrochrome	(0.11)	121.6	121.1	112.4	122.6	169.9
(iii) Ferromanganese	(0.03)	121.5	124.1	117.7	116.3	153.7
(iv) Ferrosilicon	(0.02)	94.6	100.5	94.9	98.8	127.9
(v) Other Ferro alloys	(0.03)	118.2	122.3	117.5	117.7	141.7
(vi) Manufacture of Non-Ferrous Metals	(1.69)	107.9	112.2	107.0	112.3	139.7
(e) Manufacture of Electrical Equipment	(2.93)	109.6	111.7	111.3	113.6	122.3
(f) Manufacture of Chemicals & Chemical Products	(6.47)	112.5	119.1	117.5	118.2	133.5
(g) Manufacture of Non-Metallic Mineral products	(3.20)	112.7	115.9	116.7	117.6	123.7
(h) Cotton dyed/printed Textile	(0.05)	124.0	128.7	128.3	128.8	133.9
(i) Timber/wooden plank, sawn/re-sawn	(0.05)	116.2	119.9	118.8	117.0	128.3
(j) Manufacture of Cement, Lime and plaster	(1.64)	113.8	114.3	119.5	120.9	126.4
(k) Lube Oils	(0.29)	114.0	124.8	131.7	137.2	162.0
(l) High Speed Diesel	(3.10)	84.4	97.1	93.7	80.2	128.2

VIII. Consumer Price Index (Industrial Workers) (Base 2012=100 from 2017-18 to 2019-20, Base 2016=100 for 2020-21 to 2021-22).

	284	300	323	118	124
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Source: WPI data from Office of Economic Adviser, Department for Promotion of Industry and Internal Trade and CPI data from Handbook of Statistics, RBI (September 15, 2022).

Planning

In the year 2021-22 the following assets were acquired:

S. No.	Heads	In Numbers
1.	Wagons (BLC+ Private Wagons)	12,796
2.	Locomotives including Trade	965
3.	Coaches including Trade	6,838
	(i) EMUs	32
	(ii) MEMUs	502

In addition, the following works were accomplished:

S. No.	Heads	In Kms.
1.	New lines	288.5
2.	Gauge Conversion to BG from MG/NG	635.91
3.	Double/Multiple lines	1,983.3
4.	Route Electrification	6,366
5.	Track renewals (both primary & secondary renewal)	4,276

The Plan allocation (Revised Estimates) and Actual Net Expenditure for 2021-22 compared with 2020-21, were as follows:

S. No.	Plan Head	2020-21		2021-22	
		Allocation (R.E.)	Actual Net Expenditure	Allocation (R.E.)	Actual Net Expenditure
CIVIL ENGINEERING					
1	New Lines (Construction)	@26,778.74	14,901.34	@@ 29,222.81	21,244.91
2	Gauge Conversion	#3,515.96	3,980.30	##2,997.57	2,836.87
3	Doubling	\$22,231.24	24,226.15	\$\$32,424.34	32,219.41
4	Traffic Facilities- Yard Remodeling and Others	%2,533.05	1,241.13	%%4,598.27	2,675.13
5	Road Safety Works - Level Crossings	⊗800	543.53	730.89	450.13
6	Road Safety Works - Road Over/Under Bridges	&6,329.73	4,137.44	&&5,483.07	4,222.06
7	Track Renewals	α10,500	11,657.52	13,898.68,	14,082.00
8	Bridge Works, Tunnel works & approaches	©878.63	769.67	1,365.48	1,296.79
9	Staff Welfare	≥505	470.10	518.96	473.27
10	New Lines (const.)- Dividend free Projects	-			
	TOTAL	74,072.35	61,927.18	91,240.07	79,500.57

MECHANICAL

1	Rolling Stock	^ 43,440	32,213.16	^ ^ 44,678.75	4,1406.17
2	Leased Assets– Payment of Capital Component	11,966.72	11,948.24	14,702.00	14,580.80
3	Machinery and Plant	+ + 758.85	672.76	864.68	887.07
4	Workshops including Production Units	£ 2,176.69	2,330.42	££2,512.83	2,668.39
	TOTAL	58,342.26	47,164.58	62,758.26	59,542.43

ELECTRICAL ENGINEERING

1	Electrification Projects	?6,600.75	6,141.02	? ?8,166.51	6,961.37
2	Other Electrical Works including Traction Distribution Works.	*739.70	652.23	**12,145.89	626.84
	TOTAL	7,340.45	6,793.25	20,312.40	7,588.21

SIGNAL AND TELECOMMUNICATION

1	S and T Works	<1,858.45	1,900.84	2,329.78	2,142.18
	TOTAL	1,858.45	1,900.84	2,329.78	2,142.18

OTHERS

1	Computerization	Δ563.00	390.01	485.05	317.8
2	Railway Research	■50.00	57.26	23.48	30.82
3	User's Amenities	Ω 2,676.00	2,583.45	2,351.40	1,995.41
4	Investment in Non- Govt. undertaking including JVs/SPVs	15,620.00	15,629.65	32,244.41	25,750.57
5	Other Specified Works	●830.64	482.85	862.23	542.55
6	Training/HRD	⊠150.00	86.93	144.93	75.99
7	Inventories	732.60	686.09	250.00	(-)122.45
8	M.T.Ps.	⊠1,693.50	1,543.90	1,998.00	2,514.58
	TOTAL	22,315.74	21,460.14	38,359.50	31,105.27
	GRAND TOTAL	1,63,929.25	Σ1,39,245.99	2,15,000.00	!!1,79,878.66

Revised Estimates

- @ Includes ₹542 crore under EBR(IF), ₹11,769 crore under EBR(P) and ₹13,539 crore under EBR(Special). It also include ₹7,413 crore for National Project & Projects of National (importance).
- @@ Includes ₹727.30 crore under EBR(IF) & ₹10,182.77 crore under EBR(P).
- # Includes ₹644 crore under EBR (IF), ₹2,846 crore under EBR(S)and ₹122 crore for national Project.
- ## Includes ₹675 crore under EBR (IF)
- \$ Includes ₹1,429.69 crore under EBR (IRFC), ₹1,000 crore under EBR (Special) and ₹19,705 crore under EBR(IF)
- \$\$ Includes ₹700 crore under EBR(IRFC) and ₹25,403.52 crore under EBR(IF).
- % Includes ₹500 crore under EBR (IF) and ₹792 crore EBR (P).
- %% Includes ₹2,270.22 crore under EBR (IF) and ₹325 crore under EBR(P)
- ⊗ Includes ₹800 crore under EBR (Special).
- & Includes ₹880 crore under EBR (P) and ₹5448.00 crore under EBR(Special).
- && Includes ₹1,622 crore under EBR (P)
- α Includes ₹10,500 crore under EBR (Special).

©	Includes ₹862 crore under EBR (Special).
≥	Includes ₹200 crore under EBR (Special).
>	Includes ₹33,137.31 crore under EBR (IRFC), ₹1,559 crore under EBR (P) & ₹6,739.93 crore.
^ ^	Includes ₹32,252 crore under EBR (IRFC) and ₹1,387 crore under EBR (P)
++	Includes ₹408.85 crore under EBR (Special)
£	Includes ₹10 crore under EBR (IF) and ₹1,942.45 crore EBR (Special).
££	Include ₹0.45 crore under EBR(IF).
?	Include ₹6,599 crore under EBR(IF).
??	Includes ₹8,171.51 crore under EBR (IF).
*	Includes ₹647.94 crore under EBR (Special).
**	Includes ₹11,483.23 crore under EBR (P).
<	Includes ₹1,857.08 crore under EBR (Special).
Δ	Includes ₹250 crore under EBR (Special).
■	Includes ₹0.10 crore under EBR (Special).
Ω	Includes ₹900.60 crore under EBR (Special).
●	Includes ₹250 crore for Nirbhya Fund & ₹410 crore under EBR (Special)
☒	Includes ₹141 crore under EBR(Special).
☑	Includes ₹1415 crore under EBR(Special).

Actual Net Expenditure

Σ	Excluding actual expenditure of ₹15,935.02 crores under EBR (PPP) during 2020-21.
!!	Excluding actual expenditure of ₹10,388.41 crores under EBR (PPP) during 2021-22.

Productivity:

The following table shows the indices of growth of traffic output vis-a-vis input.

Year	Indices of Growth of Traffic Output and Inputs (1950-51 = 100)						
	Traffic Output Indices			Investment Input Indices			
	Freight traffic (NTKms)	Passenger traffic (Non-suburban)	Wagon capacity	Passenger coaches	Route Kms.	Running track Kms	Tractive effort of locos
	(Rev+ Non Rev.)	passenger kms.)					
1950-51	100	100	100	100	100	100	100
1960-61	199	110	152	154	105	107	144
1970-71	289	159	226	188	112	121	178
1980-81	359	279	269	210	114	128	201
1990-91	550	394	278	219	116	133	192
2000-01	715	614	246	254	118	138	233
2010-11	1,420	4,403	294	344	120	147	343
2019-20	1,605	1,524	421	436	127	167	550
2020-21	*1,632	335	430	448	127	170	*561
2021-22	1,977	868	448	465	127	173	592
*Revised							

Passenger Business

Indian Railways is commonly used mode of public transportation in the country. During 2021-22, it carried 3,519 million passengers as against 1,250 million in 2020-21. Passenger kilometres, which is calculated by multiplying the number of journeys by mean kilometric distance in case of each class was 590 billion as against 231 billion in the previous year. Passenger earnings increased by ₹23,965.90 crore (61.12%) in comparison with 2020-21.

The trend of passenger traffic since 1950-51 is shown below:

Table I. Number of Passengers Originating

Table I. Number of Passengers Originating							(in millions)
Year	Suburban (All classes)	Non suburban				Total Non-suburban	Grand Total
		Upper class	Second Class		Total		
			Mail/Exp.#	Ordinary			
1950-51	412	25	52	795	847	872	1,284
1960-61	680	15	96	803	899	914	1,594
1970-71	1,219	16	155	1,041	1,196	1,212	2,431
1980-81	2,000	11	260	1,342	1,602	1,613	3,613
1990-91	2,259	19	357	1,223	1,580	1,599	3,858
2000-01	2,861	40	472	1,460	1,932	1,972	4,833
2010-11	4,061	100	1,046	2,444	3,490	3,590	7,651
2019-20	4,597	186	1,452	1,851	3,303	3,489	8,086
2020-21	917	49	224	60	284	333	1,250
2021-22	2,169	152	884	314	1,198	1,350	3,519
# Also includes Sleeper Class							

Also includes Sleeper Class

Table II. Passenger Kilometres

Table II. Passenger Kilometres							(in millions)
Year	Suburban (All classes)	Non suburban				Total Non-suburban	Grand Total
		Upper class	Second Class		Total		
			Mail/ Exp.#	Ordinary			
1950-51	6,551	3,790	12,537	43,639	56,176	59,966	66,517
1960-61	11,770	3,454	22,251	40,190	62,441	65,895	77,665
1970-71	22,984	4,394	37,856	52,886	90,742	95,136	118,120
1980-81	41,086	5,140	86,712	75,620	162,332	167,472	208,558
1990-91	59,578	8,712	138,054	89,300	227,354	236,066	295,644
2000-01	88,872	26,315	222,568	119,267	341,835	368,150	457,022
2010-11	137,127	62,203	500,631	278,547	779,178	841,381	978,508
2019-20	137,130	131,696	653,336	128,576	781,912	913,608	1,050,738
2020-21	30,075	42,685	153,910	4,456	158,366	201,051	231,126
2021-22	69,798	117,568	384,496	18,355	402,851	520,419	590,217
# Also includes Sleeper Class							

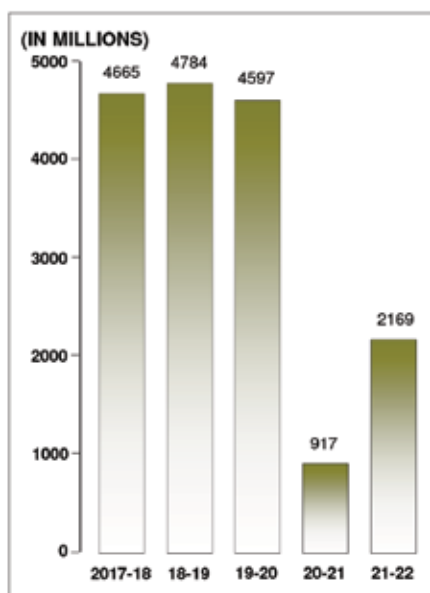
Also includes Sleeper Class.

Table III. Average Lead							(in millions)
Year	Suburban (All classes)	Non suburban				Total Non-suburban	Grand Total
		Upper class	Second Class		Total		
			Mail/Exp.#	Ordinary			
1950-51	15.9	151.6	241.1	54.9	66.3	68.8	51.8
1960-61	17.3	203.3	232.4	50.0	69.5	72.1	48.7
1970-71	18.9	274.6	244.2	50.8	75.9	78.5	48.6
1980-81	20.5	484.0	333.3	56.4	101.3	103.9	57.7
1990-91	26.4	462.8	386.5	73.0	143.9	147.6	76.6
2000-01	31.1	659.3	471.3	81.7	176.9	186.7	94.6
2010-11	33.8	623.1	478.5	114.0	223.2	234.4	127.9
2019-20	29.8	708.7	450.1	69.5	236.7	261.9	129.9
2020-21	32.8	876.3	687.0	73.8	556.8	603.5	184.8
2021-22	32.2	772.9	435.1	58.4	336.3	385.5	167.7
#Also includes Sleeper Class.							

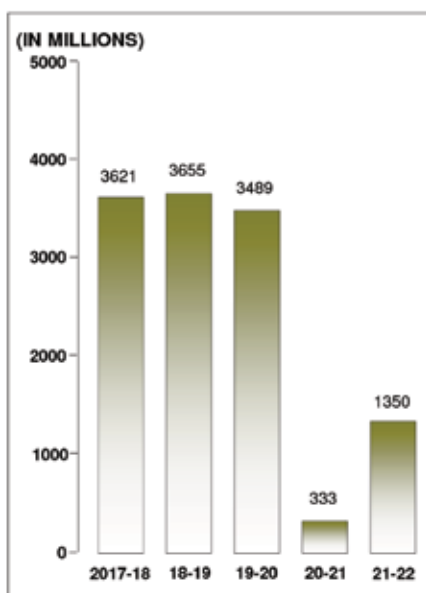
Table IV. Proportion to total traffic-No. of Passengers (Percentage)								
	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2020-21	2021-22
Non-Suburban:								
Second Class Ordinary	50.38	42.82	37.14	31.70	30.20	31.95	4.82	8.93
Second Class Mail/Express#	6.02	6.38	7.20	9.26	9.77	13.67	17.92	25.11
Upper Class	0.94	0.66	0.30	0.49	0.83	1.30	3.90	4.32
Total	57.34	49.86	44.64	41.45	40.80	46.92	26.64	38.37
Suburban(all classes)	42.66	50.14	55.36	58.55	59.20	53.08	73.36	61.63
Grand Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
#Also includes Sleeper Class.								

Table V. Proportion to total traffic – Passenger Kms. (Percentage)								
	1960-61	1970-71	1980-81	1990-91	2000-01	2010-11	2020-21	2021-22
Non-Suburban:								
Second Class Ordinary	51.75	44.77	36.26	30.20	26.10	28.47	1.93	3.11
Second Class Mail/Express#	28.65	32.05	41.58	46.70	48.70	51.16	66.59	65.14
Upper Class	4.45	3.72	2.46	2.95	5.75	6.36	18.47	19.92
Total	84.85	80.54	80.30	79.85	80.55	85.99	86.99	88.17
Suburban(all classes)	15.15	19.46	19.70	20.15	19.45	14.01	13.01	11.83
Grand Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
# Also includes Sleeper Class.								

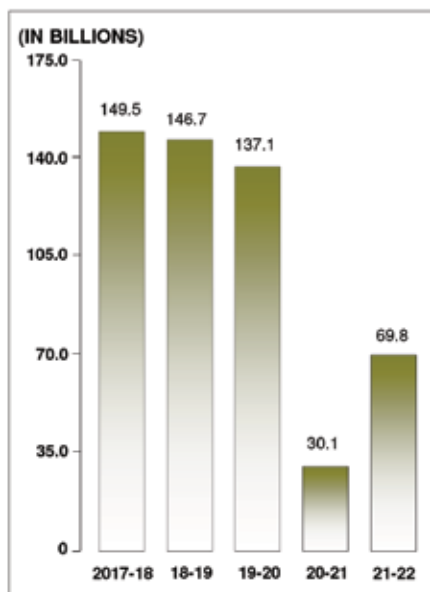
PASSENGERS ORIGINATING SUBURBAN



PASSENGERS ORIGINATING NON-SUBURBAN



PASSENGER KILOMETRES SUBURBAN



PASSENGER KILOMETRES NON-SUBURBAN

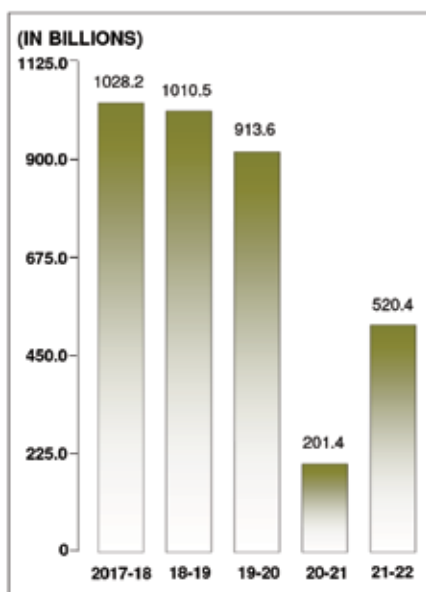


Table VI. Number of passenger trains run daily

Type of trains	Broad Gauge		Metre Gauge		Total (incl.NG)	
	2020-21	2021-22	2020-21	2021-22	2020-21	2021-22
EMU	695	5,313	0	0	695	5,313
Mail/Express	1,066	2,999	0	0	1,067	2,999
Ordinary Passenger Trains and Mixed Trains	376	1,878	1	31	378	1938
Total	2,137	10,190	1	31	2,140	10,250

Table VII. Overall average speed including halts (Kms. /hr.)

Type of trains	Broad Gauge	
	2020-21	2021-22
EMU	38.9	39.1
Mail/Express	53.8	51.0
Ordinary Passenger Trains (incl. mixed)	35.7	37.7

Note: All figures shown in the above tables (I-VII) are inclusive of Metro Railway, Kolkata.

Passenger Revenue :

Passenger earnings in 2021-22 were ₹39,214.39 crore. This was ₹23,965.90 crore (61.12%) higher than the earnings in 2020-21. Suburban traffic contributed 3.49% to the total earnings. The remaining 96.51% came from non-suburban passengers. Earnings from Second and Sleeper Class Mail/Express passengers comprised 51.05% of the total passenger earnings.

Passenger revenue in terms of earnings per passenger kilometre for different classes during 2020-21 and 2021-22 was as under:

Segment	(in paise)	
	2020-21	2021-22
Non-suburban:		
Upper class	161.09	148.20
Second Class-Mail/Express (incl. sleeper class)	49.16	52.07
Second Class-Ordinary	48.70	21.78
Non-suburban (all classes)	72.91	72.72
Suburban(all classes)	19.59	19.63
Overall average	65.97	66.44

Passenger revenue in different classes with corresponding number of passengers and Passenger Kms. in 2021-22 is given below:

Segment	No. of passengers		Passenger kms.		Revenue	
	Million	Percentage	Million	Percentage	₹ in cr.	Percentage
Non-suburban:						
Upper Class	152	4.32	1,17,568	19.92	17,423.82	44.43
Second Class Mail/ Express#	884	25.12	3,84,496	65.14	20,020.87	51.06
Second Class Ordinary	314	8.93	18,355	3.11	399.72	1.02
Total	1,350	38.37	5,20,419	88.17	37,844.41	96.51
Suburban (all classes)	2,169	61.63	69,798	11.83	1,369.98	3.49
Grand Total	3,519	100.00	5,90,217	100.00	39,214.39	100.00
#Also includes Sleeper Class.						

Passenger Services:

Train kilometres and vehicle kilometres along with density of traffic for some selected years were:

Year	Suburban (EMU)		Non-suburban		Train kms. per running track km. per day	
	Train kms. (Million)	Vehicle kms. (Million)	Train kms. + (Million)	Vehicle kms. @ (Million)	Suburban (EMU)	Non-suburban +
1950-51	9.28	119.8	154	2,678	27.9	7.1
1960-61	14.05	196.8	190	3,594	28.7	8.2
1970-71	23.05	369.4	225	4,636	30.1	8.6
1980-81	35.55	601.5	258	5,582	36.6	9.7
1990-91	48.37	840.7	316	7,739	40.0	11.5
2000-01	56.04	1,029.5	397	11,035	47.1	13.8
2010-11	73.25	1,438.5	582	18,207	46.7	19.2
2019-20	88.70	2,102.0	679	24,283	47.1	19.8
2020-21	37.90*	880.0	207	7,178*	20.1	5.9
2021-22	51.00	1,731	430	17,382	26.8	9.6

@Includes Mainline EMUs, DEMUs, DHMUs and suburban services other than EMU but excluding Rail Cars/Bus and Departmental.

+ Excludes Departmental but includes Rail Cars/Bus, MEMU, DEMU and DHMU services.

*Revised

Passenger Service Improvements:

During the year 2021-22, Indian Railways introduced new trains, extended the runs and increased the frequency of existing trains, as given below:

	Trains introduced	Train Runs extended	Frequency of trains increased	Total
Non-suburban	62	90	30	182
Suburban	46	67	-	113
Total	108	157	30	295

(Trains in singles)

Ticketless Travel:

During 2021-22, 3.45 lakh checks were conducted against ticketless/irregular travel (including carriage of unbooked luggage). About 273.14 lakh cases of ticketless/irregular travel/unbooked luggage were detected and ₹1,574.73 crore were realized on this account.

Passenger Amenities:

The allocation under the Plan Head “Passenger Amenities” in 2021-22 was ₹2,800 crore (Budget Estimate) and ₹ 2,344.55 crore (Revised Estimate).

During 2021-22, 369 Foot over Bridges were constructed.

1,253 stations have so far been identified for development under the Adarsh Station Scheme, out of which 1,213 stations have already been developed.

During the Year 2021-22, 146 stations were provided with water coolers, 49 stations were electrified, 208 passenger lifts and 192 escalators were provided at stations.

Passenger Reservation System (PRS):

New Generation e-Ticketing System (NGeT):

The Next Generation E-Ticketing (NGeT) system of IRCTC was commissioned in 2014 by CRIS, for facilitating seamless booking of reserved tickets online. The system has been continuously strengthened, which now has an upgraded capacity to book more than 26,000 tickets in a minute.

E-tickets can also be booked on IRCTC Rail Connect Mobile Apps (Android & iOS Platforms), which has been completely revamped in January 2021. On an average, 11.30 lakh tickets were booked daily in FY 2021-22 through IRCTC’s Website, Mobile Apps and authorized agents. The online ticket booking share is 80.42% of total served tickets.

IRCTC has a robust system of payment gateways with various payment options viz., Net Banking / Credit & Debit Cards / Wallets / BHIM / UPL. Even foreign users can book tickets using International Credit Cards issued outside India.

Unreserved Ticketing through Mobile Phones:

Passengers can book unreserved tickets between any pair of stations over entire Indian Railways on Mobile phones. Paperless tickets are delivered on the Mobile Phone and is embedded with a QR Code. Using this app, passengers can book Journey, Season or Platform tickets. Facility is also provided to scan station QR code & book paperless tickets (Journey/ Platform) within station premises in the ticketing area. QR coded tickets are implemented at 1,775 stations over 13 Zonal Railways. An option of 'Next Trains' has also been provided in the UTS Mobile app, which also displays indirect trains if available.

Integration was also done with Maharashtra Govt. EPASS to validate Covid vaccination certificate through mobile number to restrict travelling of unvaccinated passengers.

Mobile UTS (M-UTS):

M-UTS is a portable ticketing solution for issuance of unreserved tickets. M-UTS devices (Android phone and Bluetooth printer) can easily be carried from one location to another. The battery on the phone and printer can last for 6 to 8 hours. The M-UTS application can work in connected (GPRS or WiFi), or disconnected (i.e. offline) mode, synchronizing with the server when it senses a network.

Currency Coin-cum Card Operated/Automatic Ticket Vending Machines:

These machines issue unreserved tickets and accept Smart Cards for payment. In addition, Cash- Coin & Smart Card operated Ticket Vending Machine (CoTVMs) are implemented across 9 Zonal Railways. These machines issue unreserved tickets and accept Cash & UPI payment as well as Smart Cards for payment. ATVMs & CoTVMs provide features for issuance of platform ticket, printing of Mobile paper ticket, renewal of season ticket, top-up balance for online recharge of smart card and check train availability within 2 hours between selected pair of stations. ATVMs & CoTVMs also have the feature for fast booking of ticket for top 30 selling destinations in 2 clicks, thus queuing at the UTS counters at the Stations, is reduced during the rush hours. Recently, booking of ticket & recharge of smart card is also enabled through Paytm & Free charge dynamic UPI QR code where passenger can scan QR code through any UPI enabled payment app & make payment.

Railway Users' Amenities

Railway Users' Consultative Committees, at different levels, provide opportunities for formal consultations between the management and the

rail users with a view to improve services for rail users. Zonal Railway Users' Consultative Committees (ZRUCCs), Divisional Railway Users' Consultative Committees (DRUCCs), Konkan Railway Users' Consultative Committee (KRUCC), Metro Railway Users' Consultative Committee (MRUCC), Suburban Railways Users' Consultative Committees (SRUCC), National Railway Users' Consultative Council and Station Consultative Committees at important stations provide useful inputs to Railway Administration.

ZRUCCs has been reconstituted for a two year term from 01.02.2021 to 31.01.2023. DRUCCs have been reconstituted for a two year term from 01.01.2022 to 31.12.2023, NRUCC has been reconstituted for a two year term from 01.04.2022 to 31.03.2024.

I. Induction of Smart Coaches:

In view of the latest development in rolling stock technology, Indian Railways has planned for manufacture of SMART featured enabled coaches with ultra modern features. 101 Nos. of SMART coaches have been manufactured by MCF/Rae Bareli. Out of these, 13 coaches were manufactured in 2021-22.

These SMART coaches are equipped with CCTV cameras, PICCU, Papis system, etc., to keep close surveillance on all the activities inside coaches. This will help to mitigate any untoward incident inside coach and will further enhance the comfort, security and safety to onboard passengers. These features are further expected to enhance the level of safety and maintenance standards which will further result into reduced maintenance requirement.

II. Induction of semi-high speed Vande Bharat (Train-sets):

Semi High Speed Self Propelled (Train-set) Vande Bharat was manufactured by Integral Coach Factory/Chennai with indigenous efforts, termed Train-18/Vande Bharat Express. Vande Bharat Express State-of-the-art Train-set Vande Bharat services have been introduced between New Delhi -Varanasi and New Delhi- Shri Mata Vaishno Devi Katra in 2019-20. These trains have ultra modern features like quick acceleration, Substantial reduction in travel time, having maximum speed of 160 kmph, on board infotainment and GPS based passenger information system, automatic sliding doors, retractable footsteps and Zero discharge vacuum bio toilets etc. The Train-18 has contemporary features as per global standards.

1st train started from 17th February, 2019 between Delhi-Varanasi. 2nd train started on 5th October, 2019 between New Delh -Shri Mata Vaishno Devi Katra.

III. Complete switchover to LHB:

Ministry of Railways has decided for large scale proliferation of LHB

coaches which are technologically superior with features like Anti climbing arrangement, Air suspension (Secondary) with failure indication system and less corrosive shell. These coaches have better riding and aesthetics as compared to the conventional ICF coaches. The Production units of Indian Railways are now producing only LHB coaches from April, 2018 onwards. The production of LHB coaches are continually increased during the years: 1469 LHB coaches in 2016-17, 2480 LHB coaches in 2017-18, 4429 LHB coaches in 2018-19, 6277 LHB coaches in 2019-20, 4323 LHB coaches in 2020-21 and 6291 LHB coaches in 2021-22.

IV. Focus on amenities for unreserved passengers

(a) Antyodaya Train Service:

These are long distance fully unreserved train comprising of LHB general second class coaches with vestibules. These have additional facilities like cushioned luggage racks, additional hand hold in doorway area for the comfort of standing passengers, provision of J hooks near longitudinal luggage racks for hanging carry bags, enhanced number of mobile charging points, Fire extinguishers with anti-theft arrangement, more pleasing colour scheme for interior and exteriors, provision of MU cable in each coach for running train service with loco at both ends. At present 16 Antyodaya trains are running in service.

(b) Deen Dayalu coaches :

General second class coaches for unreserved passengers with additional facilities like Cushioned luggage racks, Additional hand hold in doorway area, provision of J hooks for hanging carry bags, Bio-toilets, Enhanced mobile charging facility, Water level indicator, Pleasing Interiors, Improved exterior colour scheme and polymerized floor coating in toilets. So far, around 3587 Deen Dayalu coaches turned out by Production Units during 2016-17, 2017-18, 2018-19, 2019-20, 2020-21, 2021-22 and are in service. Of these 749 Deen Dayalu coaches turned out 2021-22.

V. Focus on improving amenities for reserved passengers

(a) Humsafar Trains:

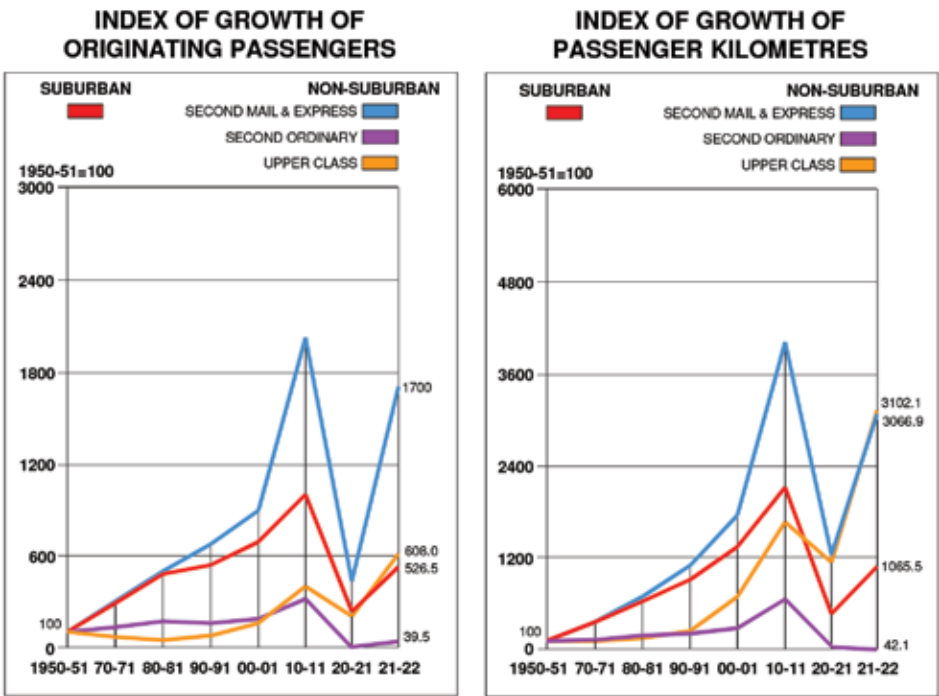
Humsafar trains having additional amenities in the coaches have been introduced for providing comfortable Air-Conditioned III Tier travel. Following major features have been introduced:- GPS based Passenger information system, Passenger announcement system, Dust bins in each bay, 4 lane coffee vending machine, improved aesthetics and pleasing colour scheme, passenger announcement System, Closed-Circuit Television (CCTV) based surveillance system, Integrated Braille displays etc. 38

Humsafar trains have been introduced in service till date.

(b) TEJAS Trains :

Indian Railways has introduced Ultra modern TEJAS trains with speed potential of 200 KMPH have been introduced which runs on LHB platform with non-executive and executive chairs car. At present, 4 Tejas trains have been introduced in service over Indian Railways out of which 2 were introduced in 2019 -20.

These ultra modern trains have following major distinguished features: Automatic entrance doors, Infotainment system (LCD Screens), Passengers Information Display System (Electronic Reservation Chart System), GPS based Passenger Information System, Fire and Smoke Detection System, Superior Toilet Fittings, Sealed Vestibules, LED lights, CCTV, Aesthetically pleasing colour scheme etc.



(c) TEJAS Rajdhani Trains :

Indian Railways has introduced Ultra modern TEJAS trains with speed potential of 200 KMPH have been introduced which runs on LHB platform with sleeper coaches. Rajdhani trains coaches are planned to be replaced with TEJAS Sleeper coaches. First Tejas sleeper rake of Agartala - Anand Vihar Rajdhani Express has been introduced in 2020-21 (since February, 2021).

These ultra modern trains have following major distinguished features: Automatic entrance doors, PA / PIS (Passenger Announcement / Passenger Information System), Fire and Smoke detection system, CCTV cameras, Improved lavatory - vacuum assisted flushing with bio-toilets, Superior toilet fittings, touch free Soap dispenser, Sealed vestibules, LED lights, Aesthetically pleasing colour scheme etc.

The coaches of 4 Rajdhani trains (Train No. 20501/02 Agartala - Anand Vihar Rajdhani Express (NFR), 12951/52 Mumbai-New Delhi Rajdhani Express (WR), 12953/54 Mumbai Nizamuddin August Kranti Rajdhani Express (WR) and 12309/10 Rajendra Nagar- New Delhi Patna Rajdhani Express (ECR)) have been replaced with Tejas Sleeper coaches over Indian Railways so far. Manufacture of TEJAS sleeper coaches for replacement of 2 more Rajdhani trains is planned in 2022-23.

(d) Vistadome coaches:

Vistadome coaches provide panoramic view, through wider body side windows as well as through transparent sections in the roof, thus enabling the passengers to enjoy the scenic beauty of the places through which they travel. Presently, 73 Vistadome coaches are available over various sections of Indian Railways.

7 in 2020-21 and 15 LHB type BG Vistadome in 2021-22 were have been manufactured by ICF/Chennai.

VI. Provision of Double Acting doors in coaches:

Double Acting door in coaches are two way swing AC compartment doors for easy evacuation of passengers. Such doors need to be provided in AC coaches so as to improve the fire worthiness and enable passengers to quickly evacuate from the coach in the event of fire.

VII.Improving interiors of Coaches - Up-gradation / modernization of rakes:

Project Utkrisht: IR has also launched Project Utkrisht in order to improve the condition of ICF type coaches running in Mail / Express trains. Up gradation of 640 rakes of Mail / Express trains has been taken up under Project Utkrisht for improvement in patronized train services. Work in 506 rakes has already been completed under Project Utkrisht. Work has been completed in 43 rakes in 2021-22.

VIII. Other facilities to improve train facilities

(a) Quick Watering Facilities

Quick watering facilities are being provided for quick watering in trains

within stipulated halt of the train. These facilities are essential to ensure availability of adequate water in coaches throughout the journey. At present, 95 stations have been provided with Quick Watering Facilities. Out of these, 26 stations have been provided with Quick Watering Facilities in 2021-22.

(b) Automatic Coach Washing Plants

Automatic Coach Washing Plants have been installed over Zonal Railways to clean exterior of coaches more effectively and efficiently. In addition to excellent cleaning the direct water consumption also gets reduced avoiding wastage and recycling the water through water recycling plant integrated with this plant. 112 locations have been identified for provision of ACWP. Instructions have already been issued to General Managers of Zonal Railways to provide automatic coach washing plants in all coaching depots. Now, Automatic Coach Washing Plants are available at 52 locations. Work has been completed in 21 locations in 2021-22.

(c) Proliferation of Bio- Toilets

As a part of “Swachh Bharat Mission”, Indian Railway is proliferating bio-toilets on all its coaching stock so that no human waste is discharged from coaches on to the track. Indian Railways has completed fitment of Bio - toilets in all its coaches running on line. 79,269 coaches (2,81,562 Bio - toilet) have been fitted with Bio-toilet. Of these, 6,159 has been fitted in 2021-22. Details of provision of Bio-toilets are as under:

Years	Bio-Toilets	Coaches
2004-2017	69,322	19,770
2017-2018	57,429	15,017
2018-2019	69,166	19,137
2019-2020	46,988	14,766
2020-2021	16,085	4,420
2021-2022	22,572	6,159
Total	2,81,562	79,269

Further, IR has planned to supplement the existing Bio - toilet system with Vacuum flushing system toilet (Bio-Vacuum Toilets), which substantially reduces the requirement of water for flushing, while ensuring effective / proper flushing of fecal matter from the pans. Indian Railways have provided Bio Vacuum Toilet in about 1450 LHB coaches and it has been decided to provide Bio Vacuum Toilets in newly manufactured AC LHB Coaches of premium rakes. Sanctions for 8,500 coaches are also.

IX. AC-III Tier (LWACCNE) Coach

IR has planned to introduce AC –III class to cater the needs of general masses and fulfilling their expectation of travel to AC class. These coaches are planned to replace normal general sleeper class coaches in trains. The production of AC –III Economy class coaches are continually increased during the years: One prototype coach was turned out in 2020-21, 271 coaches in 2021-22.

X. Special Coach Design

Indian Railway has incorporated Divyangjan Integral Coach Factory (ICF) design SLRD (Second class cum Luggage cum Guard Van & Divyangjan Compartment) coaches. These coaches have a suitable designed compartment & toilet adapted to the needs of the Divyangjan passengers.

In these coaches, wider entrance door, wider berths, wider compartments, larger lavatory and lavatory doors etc. have been provided. Inside the toilets additional grab rails on the side walls for support and wash basin and mirror at a lower height are also available inside the toilets.

It is endeavored to have at least one coach in each Mail/Express train having ICF type coaches. At present, 3374 ICF type SLRD & 359 GSRD coaches (as on 31.03. 2022) are in the fleet of Indian Railways.

Further, Coach Production Units have already started manufacturing LHB Second Luggage, Guard & Divyang Compartment (LSLRD) type coaches for Divyang Passengers which are being inducted in IR progressively. 11 such coaches manufactured in Year 2018-19, 21 such coaches manufactured in year 2019-20, 336 coaches manufactured in Year 2020-2021 and 547 coaches manufactured in Year 2021-22.

At present, 915 LHB type LSLRD/LDSLRL (as on 31.03.2022) are manufactured over Indian Railways and further proliferation of LSLRD with augmentation in Production Plan has been planned.

Further, All Production Units have been advised to provide at least two doors of 920 mm width one on each side of the coach in future in all newly designed coaches. This will ensure improved accessibility to Divyangjan passengers inside coaches.

For the assistance of the visually impaired travellers, integrated Braille Signage, i.e. Signage superimposed with Braille scripts, are being provided in all the newly manufactured coaches. Further, retro-fitment of the same in existing coaches is also continuing in a phased manner.

XI. Details of New Rolling Stock placed on line during the year 2021-22.

Type of Rolling Stock	Units included on IR					
	Replacement Account			Additional Account		
	BG	MG	NG	BG	MG	NG
Passenger Carriages	1,254	0	0	4,296	0	0
Other Coaching Vehicles	240	0	0	501	0	0
Total	1,494	0	0	4,797	0	0

XII. Rolling Stock condemned during the Year 2021-22

Type of Rolling Stock	Stock condemned		
	BG	MG	NG
Passenger Carriages	1,254	0	14
Other Coaching Vehicles	240	0	0
Total	1,494	0	14

Cleanliness on trains:

- Mechanized Cleaning of Coaches at both ends is being carried out through professional agencies in around 196 coaching depots. Machines like high pressure jet cleaners, floor scrubbers, wet & dry vacuum cleaners, hand held buffing machines etc. are deployed for the purpose.
- On Board Housekeeping Service (OBHS) has been provided in more than 1100 pairs of important long distance Mail/Express trains for cleaning of coach toilets, doorways, aisles and passenger compartments during the run of the trains.
- Clean Train Station (CTS) scheme has been prescribed for limited mechanized cleaning at 38 stations.
- Provision of dustbins is being done in AC and non AC coaches.
- Standard bid document (SBD) and General Condition of Contract for Services (GCCS) have been issued with enabling provision to improve handling and effectiveness of cleaning contracts.
- A total 242 nos. of manpower based mechanized coach cleaning, station cleaning and colony sanitization contracts have been converted to outcome based contracts.

Some Green Initiatives:

- Indian Railways have installed bio-toilets in all BG passenger coaches to prevent open discharge of human waste on Railway Tracks from trains.
- 55 Industrial Units including 39 workshops, 7 PUs, 8 Loco Sheds

and 1 Stores depot are “GreenCo” certified. These include 2 platinum and 15 Gold Ratings.

- 32 Railway stations and 32 Railway buildings including schools, hospitals have been “GreenCo” certified.
- Around 700 Railway Stations have been certified for implementation of Environment Management System ISO: 14001.
- Indian Railways has been taking number of steps towards water conservation. These include revival of old water bodies, conservation of existing bodies, setting up of water recycling plants, rain water harvesting and carrying out water audits. Zonal Railways have been advised for adherence to the Indian Railway Water Policy 2017 in true spirit.
- Instructions for placement of separate waste bin for bio-degradable and non-biodegradable waste at appropriate distance at stations/platforms/foot over bridges and for disposal of the waste in an eco-friendly manner.
- Small scale Waste to Compost Plants have been set up at various stations for conversion of waste into compost.
- Around 545 stations have received Consent to Operate (CTO) from respective State Pollution Control Boards.
- Indian Railway has been planted around 1 crore trees annually since 2017 onwards. 72 lakh saplings have been planted during year 2021-22.

Catering Services:

Catering services are provided to the travelling passengers in trains and at stations. Catering Policy-2017 mandates the service of meals in trains from the Base Kitchens owned, operated and managed by IRCTC. However, due to COVID-19 pandemic, it was decided by Ministry of Railways to introduce the service of branded pre-cooked “Ready to Eat” (RTE) meals, in place of cooked food, to ensure hygiene and food safety through elimination of multiple food handling and contact points. Later, in view of resurgence of rail travel and easing of COVID lockdown restrictions in eateries, restaurants, hotels and other such places across the country, and following the Ministry of Railways’ decision on 12.11.2021 to restore normal train operations, the decision to allow service of only RTEs was reconsidered and Ministry of Railways on 19.11.2021 issued instructions to IRCTC to resume cooked food services while also continuing with RTEs in trains.

Indian Railways provide catering services to the travelling passengers through Pantry Cars (422 pairs of trains), Train Side Vending (867 pairs

of trains), E-catering available on 304 stations with an average of 36,561 meals per day and Static Units at Stations. Static Catering Units include 568 Major Static Units (Food Plaza, Fast Food Units, Jan Ahaar, Cell Kitchens, Base Kitchens, Refreshment Rooms and Automatic Vending Machines) and 9098 Minor Static Units (all stalls, trolleys) on Indian Railways. In addition, there are 1926 Water Vending Machines, 1365 Multi Purpose Stalls, 362 Book Stalls, 44 Miscellaneous/Curio Stalls, 03 exclusive Chemist Stalls and 01 Book Stalls cum Chemist Corners operational at stations to ensure availability of items of travelling needs of passengers.

In its endeavour to bring noticeable improvement in catering services on Indian Railways, a number of initiatives have been taken during 2021-22 which include the following:

- Upgradation of Base Kitchen/Kitchen Units undertaken.
- CCTV Cameras have been installed in upgraded Base Kitchens /Kitchen Units for better monitoring of food preparation right at the source. Real time monitoring of the base kitchens through Artificial Intelligence and sharing of live streaming.
- Deployment of on board IRCTC supervisors on trains.
- QR codes have been introduced on food packets enabling display of details like name of kitchen, date of packaging, expiry date etc.
- Segregation of veg and non-veg food by means of stickers on food packets.
- To generate printed bills and invoice reflecting all details of transactions undertaken at catering units, hand held POS machines have been provided in catering units.
- Awareness Campaigns launched:
 - MRP on all products- “ No MRP, the licence get cancelled”
 - No Bill - The food is for FREE.
 - ‘No Tips’ is stitched/displayed on the uniforms of service providers.
- Third Party Audit is done to examine hygiene and cleanliness in Pantry Cars and Kitchen Units. Customer satisfaction survey is also conducted.
- To ensure compliance of Food Safety Norms, Food Safety and Standards Authority of India (FSSAI) certification from Designated Food Safety Officers of each catering unit has been made mandatory.
- Food Safety Supervisors have been deployed at Kitchen Units to monitor food safety and hygienic practices.
- Regular and surprise inspections are conducted by Railway/IRCTC officials including Food Safety Officers.

Freight Operation

Revenue earning freight traffic handled during 2021-22 was 1415.87 million tonnes. NTKMs earned during the year were 872 billion. Total loading and freight output inclusive of non-revenue traffic were 1418.84 million tonnes and 872 billion NTKMs respectively. Commodity wise loading of revenue earning traffic was as follows

Commodity Group	Tonnes carried* (Millions)		Absolute Variation over last year	Percentage to total
	2020-21	2021-22		
Coal				
i) for steel plants	52.95	56.70	3.75	4.00
ii) for washeries	0.34	0.07	(-)0.27	0.00
iii) for thermal power houses	218.11	271.12	53.01	19.15
iv) for other public users	270.42	324.91	54.49	22.96
Total	541.82	652.80	110.98	46.11
Raw material for steel plants except iron ore	24.90	29.03	4.13	2.05
Pig iron and finished steel				
i) from steel plants	32.92	36.15	3.23	2.56
ii) from other points	27.14	32.35	5.21	2.28
Total	60.06	68.50	8.44	4.84
Iron ore				
i) for export	25.18	7.66	(-)17.52	0.54
ii) for steel plants	84.67	91.46	6.79	6.46
iii) for other domestic users	49.28	69.24	19.96	4.89
Total	159.13	168.36	9.23	11.89
Cement	120.40	137.19	16.79	9.69
Foodgrains	62.82	73.38	10.56	5.18
Fertilizers	53.79	49.18	(-)4.61	3.47
Mineral Oil (POL)	42.48	44.46	1.98	3.14
Container service				
i) Domestic containers	12.61	17.64	5.03	1.25
ii) EXIM containers	50.55	56.62	6.07	4.00
Total	63.16	74.26	11.10	5.25
Balance other goods	102.38	118.71	16.33	8.38
Total	1,230.94	1,415.87	184.93	100.00
*Excludes loading on Konkan Railway.				

The following tables show the growth of freight traffic over the years:

I. Revenue Earning Freight Traffic (Excl. KRCL)

Year	Tonnes (Millions)	Index (1950-51 = 100)	Net Tonne Kms (Millions)	Index (1950- 51 = 100)	Lead (Kms)	Index (1950- 51 = 100)
1950-51	73.20	100.00	37,565	100.00	513	100.00
1960-61	119.80	163.70	72,333	192.60	603	117.60
1970-71	167.90	229.40	110,696	294.70	659	128.50
1980-81	195.90	267.60	147,652	393.10	754	147.00
1990-91	318.40	435.00	235,785	627.70	741	144.40
2000-01	473.50	646.90	312,371	831.50	660	128.70
2010-11	921.73	1,259.20	625,723	1,665.71	679	132.4
2019-20	1,208.41	1,650.83	7,07,665	1,883.84	586	114.23
2020-21	1,230.94	1,681.61	7,19,762	1,916.04	585	114.04
2021-22	1,415.87	1,934.25	8,71,816	2,320.82	616	120.08

II. Movement of bulk commodities in the last four years:

S. No.	Commodity group	2018-19		2019-20		2020-21		2021-22	
		Million Tonnes	Percent- age	Million Tonnes	Percent- age	Million Tonnes	Percent- age	Million Tonnes	Percent- age
1	Coal	605.84	49.60	586.87	48.56	541.82	44.02	652.80	46.11
2	Foodgrains	39.31	3.22	37.53	3.10	62.82	5.10	73.38	5.18
3	Iron & Steel	53.99	4.42	53.13	4.40	60.06	4.88	68.50	4.84
4	Iron ore	137.34	11.24	153.37	12.69	159.13	12.93	168.36	11.89
5	Cement	117.34	9.61	110.10	9.11	120.40	9.78	137.19	9.69
6	POL (Mineral oils)	43.01	3.52	44.68	3.70	42.48	3.45	44.46	3.14
7	Fertilizers (Chemical manures)	51.83	4.24	51.39	4.25	53.79	4.37	49.18	3.47
8	Limestone and Dolomite	30.35	2.48	30.63	2.54	30.84	2.51	36.47	2.58
9	Stones (including gypsum) other than marble	21.58	1.77	18.24	1.51	27.30	2.22	24.20	1.71
10	Salt	4.86	0.40	4.30	0.36	5.88	0.48	8.03	0.57
11	Sugar	3.02	0.25	2.89	0.24	3.81	0.31	5.88	0.42
	Total	1,108.47	90.75	1,093.13	90.46	1,108.33	90.04	1,268.45	89.60
12	Commodities other than above	113.01	9.25	115.28	9.54	122.61	9.96	147.42	10.40
	Grand Total	1,221.48	100.00	1,208.41	100.00	1,230.94	100.00	1,415.87	100.00

III. Freight Train Kilometers and Wagon Kilometres

Year	Freight train kms.		Wagon kilometres@ (in terms of 4- wheelers)	
	Total(Million)	Per running track km per day	Total (Million)	Percentage of loaded to total
1950-51	112	5.2	4,370	70.7
1960-61	161	6.9	7,507	70.5
1970-71	202	7.7	10,999	69.7
1980-81	199	7.2	12,165	69.5
1990-91	245	8.5	19,230	65.5
2000-01	261	8.7	27,654	60.9
2010-11	368	11.6	17,749	66.5
2019-20	397	11.0	18,846	62.5
2020-21	418	11.6*	19,021*	62.4*
2021-22	481	12.8	22,116	63.6

*Revised

IV. Tonnes Originating, Net Tonne Kms. and Earnings from bulk commodities in 2021-22

S. No.	Commodity group	Tonnes originating		Net tonne kilometres		Earnings	
		In million	%age to total	In million	%age to total	₹ In crore	%age to total
1	Total Coal	652.80	46.11	3,27,754	37.59	65,856.08	47.28
2	Food Grains	73.38	5.18	87,076	11.13	10,660.52	7.65
3	Iron & steel	68.50	4.84	60,239	6.91	9,124.90	6.55
4	Iron ore	168.36	11.89	66,123	7.58	13,092.57.	9.40
5	Cement	137.19	9.69	81,476	9.35	10,604.94	7.61
6	Mineral oils	44.46	3.14	31,359	3.60	5,822.02	4.18
7	Chemical Manures	49.18	3.47	44,530	5.11	5,428.27	3.90
8	Limestone & Dolomite	36.47	2.58	20,945	2.40	2,888.51	2.07
9	Stones other than Marble & Gypsum	24.20	1.71	8,523	0.98	2,124.47	1.06
10	Salt	8.03	0.57	11,920	1.37	978.82	0.70
11	Sugar	5.88	0.42	8,669	0.99	858.52	0.62
	Total	1,268.45	89.60	7,58,614	87.01	1,27,439.62	91.02
12	Commodities other than above	147.42	10.40	1,13,202	12.99	11,847.68	8.98
	Grand Total	1,415.87	100.00	8,71,816	100.00	1,39,287.30	100.00

V. Some selected efficiency indices of freight operation during the last four years

			2018-19	2019-20	2020-21	2021-22
Net tonne kilometres per wagon per day@	BG		7,747	7,057	6,861	8,384
Wagon kilometers per wagon per day@	BG		203.9	188.7	170.01*	211.8
Net tonne kilometres per engine hour	Diesel	BG	13,001	11241	10,735*	10,940
	Electric	BG	18,802	16548	15,095*	16,131
Net tonne kilometres per engine day on line	Diesel	BG	2,89,419	2,40,027	2,10,990*	2,61,932
	Electric	BG	3,89,070	2,93,461	3,70,520*	3,81,507
*revised @ From 2010-11 onward figures in terms of 8-wheelers						

VI. Share of Tonnage, Earnings and Net tonne kms. of 30 selected commodities in 2021-22

S. No.	Commodity group	Tonnes Originating		Earnings		Net Tonne Kms.	
		In thousand	%age to Total	in ₹ crore	%age to Total	in millions	%age to Total
1	Total Coal	652806	46.11	65856.08	47.28	327754	37.59
2	Iron Ore	168363	11.89	13092.57	9.40	66123	7.58
3	Cement	137186	9.69	10604.94	7.61	81476	9.35
4	Food Grains	73384	5.18	10660.52	7.65	97076	11.13
5	Iron & Steel	68495	4.84	9124.90	6.55	60239	6.91
6	Total Exim Container	56618	4.00	4292.13	3.08	43781	5.02
7	Chemical Manures	49177	3.47	5428.27	3.90	44530	5.11
8	Mineral Oils	44462	3.14	5822.02	4.18	31359	3.60
9	Limestone & Dolomite	36466	2.58	2888.51	2.07	20945	2.40
10	Stone Other Than Marble and Gypsum	24197	1.71	1476.99	1.06	8523	0.98
11	RMC Carried In General Service Wagons	20521	1.45	1159.35	0.83	4753	0.55
12	Total Domestic Container	17644	1.25	1982.40	1.42	22841	2.62
13	Ores Other than Manganese and Iron	9069	0.64	584.58	0.42	2852	0.33
14	Jute Manufactured	8039	0.57	407.30	0.29	4871	0.56
15	Salt	8033	0.57	978.82	0.70	11920	1.37
16	Non-Ferrous Metal	7935	0.56	851.58	0.61	4711	0.54
17	Sugar	5886	0.42	858.52	0.62	8669	9.99

S. No.	Commodity group	Tonnes Originating		Earnings		Net Tonne Kms.	
		In thousand	%age to Total	in ₹ crore	%age to Total	in millions	%age to Total
18	Gypsum	5874	0.41	647.48	0.46	4526	0.52
19	Lime	3417	0.24	509.16	0.37	4004	0.46
20	Provisions	3059	0.22	350.87	0.25	3394	0.39
21	Manganese Ores	1738	0.12	153.56	0.11	999	0.11
22	Sand	1547	0.11	140.26	0.10	1148	0.13
23	Cement Manufactured	1387	0.10	85.08	0.06	625	0.07
24	Edible Oils	1277	0.09	142.15	0.10	1869	0.21
25	Fruits & Vegetable Fresh	1055	0.07	119.72	0.09	1860	0.21
26	Caustic Soda	897	0.06	75.37	0.05	558	0.06
27	Steel Pipes	435	0.03	97.09	0.07	1106	0.13
28	Fodder Oil Cake	374	0.03	77.35	0.06	816	0.09
29	China Clay	250	0.02	29.63	0.02	257	0.03
30	Soda Ash	151	0.01	36.71	0.03	311	0.04

Freight Structure:

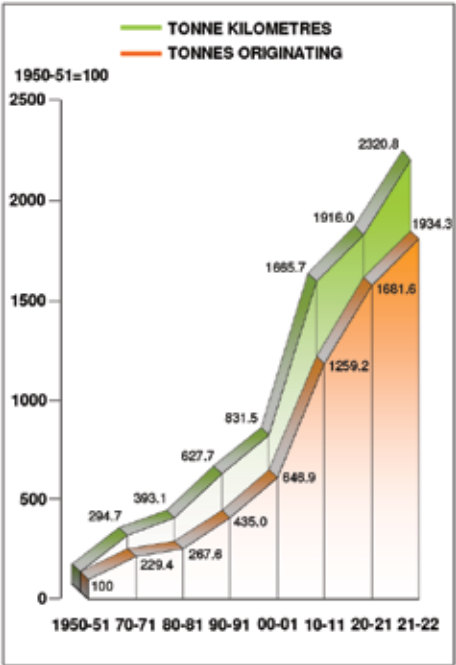
There was no increase in freight in 2021-22. However, various initiatives were taken during this period which includes Round trip charging for ultra lead(<50KM) container traffic, e-RD-provision of single OTP for a day, e-RD-Submission of Letter of Credit (LC) in case of goods traffic pertaining to Bangladesh, Rail Green Point (Carbon saving while transportation by Rail), etc.

Indian Railway has permitted transportation of Liquid Medical Oxygen (LMO) in cryogenic tankers under Roll on-Roll off scheme utilizing DBKM/ BOM, BRN etc. as a special case. Class of charge for truck/tanker will be LR3 and in respect of payload including gas the charge shall be class be class 120 under train load. In case of wagon load, the charge will be 10% more than train load. Guidelines have also been issued for movement of Liquid Medical Oxygen in containers in containers by Container Train Operators. Haulage Charge will be levied on 'Haulage rate per TEU(FAK)' basis. No haulage charge will be levied for empty flats in the rake.

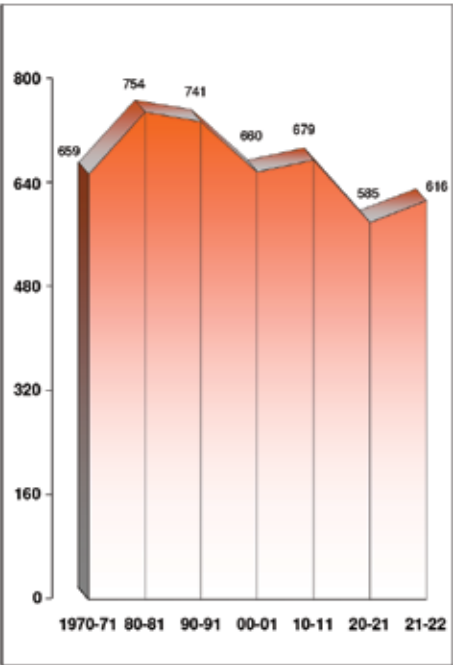
Freight Marketing:

- 1. Gati Shakti Multi Modal Cargo Terminal (GCT):** Indian Railways has launched a new 'Gati Shakti Multi Modal Cargo Terminal (GCT)' policy on 15.12.2021. The objective of the policy is to boost

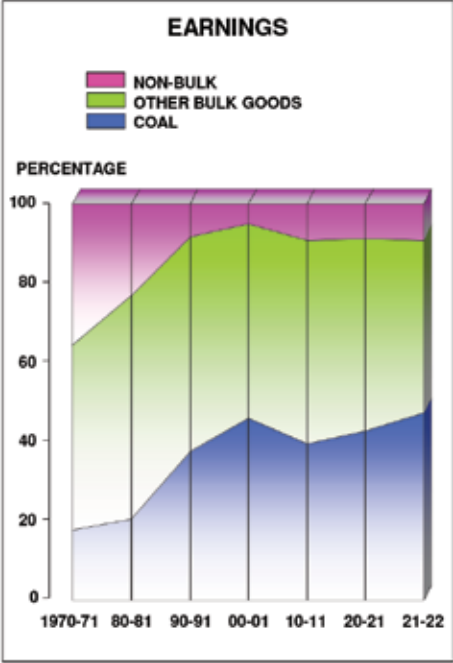
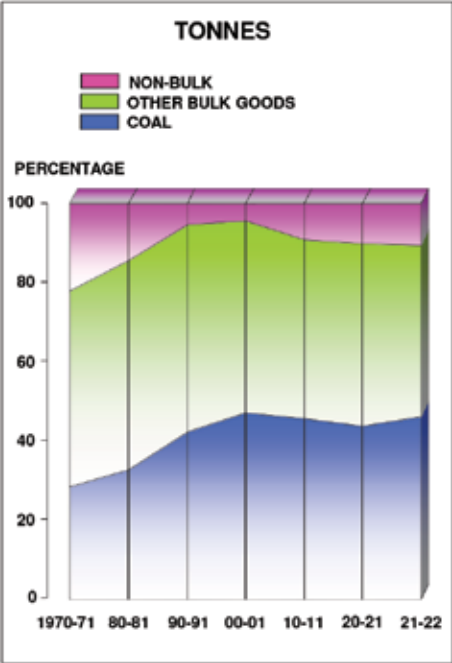
**INDEX OF GROWTH OF FREIGHT
(REVENUE TRAFFIC)**



**AVERAGE LEAD OF FREIGHT (KMS.)
(REVENUE TRAFFIC)**



SHARE OF BULK COMMODITIES IN FREIGHT TRAFFIC



investment from industry in development of additional terminals for handling rail cargo. These terminals will be constructed on non Railway land, as well as partially or fully on Railway land. All new upcoming terminals shall be commissioned as GCT.

2. Development of Goods Shed through private investments: For development of Goods shed at small/roadside stations through private investment a policy was issued on 14.10.2020. The policy aims to augment terminal capacity through private participation by allowing setting up of new goods sheds facilities and developing existing goods sheds.

3. Procurement of rakes for freight traffic by inviting private investments:

i. General Purpose Wagon Investment Scheme (GPWIS) – To allow investment for procurement of General Purpose Wagons by End users, Public Sector Undertaking (PSUs), Port Owner, Logistics Providers and Mines Owners. The scheme permits eligible investors to invest in minimum of one rake of general purpose wagon in any of the desired circuit(s) to carry any commodity in these rakes.

ii. Liberalized Special Freight Train Operators (LSFTO) Scheme: Liberalized Special Freight Train Operators (LSFTO) Scheme has been started in the year 2020 by amalgamating erstwhile two schemes viz. Liberalized Wagon Investment Scheme (LWIS) and Special Freight Train Operator (SFTO) Scheme. The objective of the policy is to increase Railways share in transportation of non conventional traffic in high capacity and special purpose wagons to increase the commodity base of Rail Traffic. This policy provides an opportunity to logistics service providers or manufacturer to invest in wagons and use advantages of rail transport of selected commodity to create a win-win situation for railways and themselves. This also creates an avenue for end users to optimally utilize their rolling stock by transporting their commodities as well as commodities of third party.

iii. Automobiles Freight Train Operator (AFTO) Scheme: Automobile Freight Train Operator Scheme permits procurement and operation of special purpose rakes by private parties for transportation of automobiles sector.

iv. Wagon Leasing Scheme (WLS): The Scheme introduced the concept of leasing of railway wagons on Indian Railways. The

scheme aims at induction of rakes of general purpose wagons, special purpose wagons and wagons for containers movements through PPP route. Wagon Leasing Companies can lease wagon under Automobiles Freight Train Operator (AFTO) scheme, General Purpose Wagon Investment Scheme (GPWIS), Liberalized Special Freight Train Operators (LSFTO) scheme, Automobiles Freight Train Operator (AFTO) scheme and also to Container Train Operators

Claims:

IR paid ₹28.63 crore as claim compensation for goods/parcel/luggage during the Financial Year 2021-22 as compared to ₹84.01 crore paid in the corresponding period of the last year. The trend of claims settlement in the preceding five periods is given below:

Year	Number of Claims received	Number of Claims paid	Gross amount of compensation paid (₹ in crores)
2017-18	7,251	1,062	29.35
2018-19	5,799	873	46.38
2019-20	5,640	1,196	19.13
2020-21	3,845	*266	*84.01
2021-22	3,401	194	28.63
*Revised			



A Picturesque view of Konkan Railway Route, KRCL

Asset Utilisation

Some of the major efficiency indicators of IR's operational performance over the years is given in the following tables:

A. Engine kilometres per day per engine in use

(i) Goods

Year	Broad Gauge			Metre Gauge		
	Steam	Diesel	Electric	Steam	Diesel	Electric
1950-51	150	-	191	140	-	98
1960-61	155	300	156	140	273	171
1970-71	121	347	316	133	280	245
1980-81	89	303	274	107	276	206
1990-91	52	445	398	88	399	224
2000-01	-	398	450	18	345	203
2010-11	-	384	478	-	102	-
2019-20	-	380	336	-	-	-
2020-21	-	420	* 526	-	-	-
2021-22	-	484	445	-	-	-

*Revised

(ii) Passenger

Year	Broad Gauge			Metre Gauge		
	Steam	Diesel	Electric	Steam	Diesel	Electric
1950-51	249	-	397	211	-	130
1960-61	274	250	363	220	274	177
1970-71	250	669	437	228	383	376
1980-81	210	610	453	199	541	405
1990-91	189	673	482	185	569	382
2000-01	-	577	542	36	447	385
2010-11	-	594	671	34	390	-
2019-20	-	559	593	30	144	-
2020-21	-	*493	*678	30	7	-
2021-22	-	703	747	28	-	-

*Revised

Note: In view of the change in method of compilation of diesel and electric loco usage since 1981-82, the figures of earlier years are not strictly comparable.

B. GTKms. (excluding weight of engine and departmental traffic) per kg. of tractive effort:

Year	Broad Gauge	Metre Gauge
1950-51	1,525	1,191
1960-61	1,864	1,444
1970-71	2,147	1,714
1980-81	2,372	1,708
1990-91	3,873	2,263
2000-01	4,498	1,628
2019-20	3,699	316
2020-21	2,713	*32
2021-22	3,697	165

*revised

C. Density:

The density of traffic in terms of NTKms, PKms. and GTKms per route km. and per running track km. are given in the following two tables.

Year	(Millions)					
	Net Tonne Kms. Per Route Km.		Passenger Kms. Per Route Km.		Gross Tonne Kms. Per Route Km.	
	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.
1950-51	1.50	0.25	1.77	0.85	5.24	1.20
1960-61	2.76	0.54	2.03	0.89	8.32	2.18
1970-71	3.61	0.81	2.88	1.25	10.38	2.87
1980-81	4.34	0.80	5.15	1.72	12.55	2.76
1990-91	6.30	0.97	7.12	1.97	18.13	3.17
2000-01	6.96	0.24	9.49	2.08	21.95	1.79
2010-11	11.35	0.09	17.36	2.91	31.88	1.37
2019-20	11.07	-	16.42	0.20	32.03	0.21
2020-21	11.18	-	3.59	0.07	23.17	*0.02
2021-22	13.40	-	9.06	0.06	33.50	0.10

*revised

Year	(Millions)					
	NTKMs Per Running Track Km.		Passenger Kms. Per Running Track Km.		Gross Tonne Kms. Per Running Track Km.	
	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.
1950-51	1.23	0.24	1.45	0.85	4.29	1.19
1960-61	2.19	0.54	1.61	0.87	6.59	2.15
1970-71	2.60	0.79	2.07	1.22	7.49	2.87
1980-81	3.06	0.76	3.63	1.64	8.84	2.63
1990-91	4.41	0.92	4.98	1.87	12.67	3.01
2000-01	4.93	0.24	6.73	2.03	15.55	1.75
2010-11	8.08	0.09	12.37	2.75	22.72	1.29
2019-20	7.44	-	11.03	0.19	21.52	0.20
2020-21	7.40	-	2.37	0.07	15.34	0.02
2021-22	8.73	-	5.90	0.06	21.82	0.12

D. Coach Utilisation:

In 2021-22 the vehicle Kms. per vehicle day was 411 on BG and 27 on MG.

Year	Vehicle Kms. Per Vehicle Day	
	BG	MG
1950-51	264	204
1960-61	252	177
1970-71	282	191
1980-81	314	186
1990-91	408	254
2000-01	461	269
2010-11	529	203
2019-20	534	114
2020-21	185	3
2021-22	411	27

E. Average freight train load:

The average net load per train in 2021-22 was 1,817 tonnes on BG. The average gross load per train was 3,094 tonnes on BG.

Year	Average Train Load (tonnes)			
	Net Load		Gross Load (including weight of engine)	
	B.G.	M.G.	B.G.	M.G.
1950-51	489	185	1,068	435
1960-61	656	298	1,354	648
1970-71	737	378	1,507	753
1980-81	884	487	1,721	871
1990-91	1,079	562	2,122	962
2000-01	1,233	414	2,533	806
2010-11	1,702	488	3,063	902
2019-20	1,763	-	3,025	-
2020-21	1,738	-	2,925	-
2021-22	1,817	-	3,094	-

F. Average freight train speed (Kms./hour):

Traction-wise and gauge-wise average speed of goods trains over the years is indicated in the following table:

Year	Broad Gauge		Metre Gauge All	
	Diesel	Electric	All traction	traction
1950-51	-	20.8	17.4	15.0
1960-61	22.2	19.5	16.1	13.7
1970-71	22.9	25.2	17.9	14.7
1980-81	21.3	22.8	19.7	15.1
1990-91	22.6	23.1	22.7	17.6
2000-01	22.4	25.4	24.1	19.6
2010-11	23.5	27.0	25.6	14.7
2019-20	23.4	25.4	23.6	-
2020-21	40.6	45.8	43.2*	-
2021-22	36.5	38.1	37.8	-

*Revised

G. Net tonne Kms. per engine hour and per goods train hour:

During 2021-22, NTKMs per engine hour stood at 14,520 for BG. NTKMs per goods train hour for BG was 79,195.

The table below shows the unit output measured by these indices in selected years:

Year	Net tonne Kms. per engine hour		Net tonne Kms. per goods train hour	
	B.G.	M.G.	B.G.	M.G.
1950-51	3,283	1,238	8,590	2,884
1960-61	4,170	1,766	10,808	4,232
1970-71	4,904	2,525	13,492	5,824
1980-81	6,295	3,345	17,677	7,562
1990-91	10,393	5,027	24,787	10,551
2000-01	12,850	3,773	29,752	8,539
2010-11	20,805	2,407	43,905	5,523
2019-20	14,287	-	42,154	-
2020-21	*13,693	-	*74,021	-
2021-22	14,520	-	79,195	-

*revised

H. Wagon Utilisation:

On an average, a wagon moved 211.8 kms. per day on BG in 2021-22. NTKMs per wagon per day on BG was 8,384. NTKMs per annum per tonne of wagon capacity on BG was 40,555. These indices of wagon utilization are given below:

Year	(in terms of 4-wheelers)					
	Net tonne kms. per tonne of wagon capacity per annum		Wagon kms. per wagon per day		Net tonne kms. per wagon per day	
	B.G.	M.G.	B.G.	M.G.	B.G.	M.G.
1950-51	11,833	9,021	62.3	50.2	710	304
1960-61	16,558	10,125	76.9	51.6	998	405
1970-71	15,117	12,583	73.4	58.4	908	524
1980-81	16,285	11,013	73.4	47.3	986	522
1990-91	23,418	18,629	110.5	69.7	1,407	810
2000-01	33,289	7,981	179.0	43.8	2,042	394
2010-11 +	57,953	7,300	262.1	31.6	9,247	663
2019-20	40,996	-	188.7	-	7,057	-
2020-21	40,216	-	*170.1	-	6,861	-
2021-22	40,555	-	211.8	-	8,384	-

(+) in terms of 8 wheelers from 2010-11 onwards.

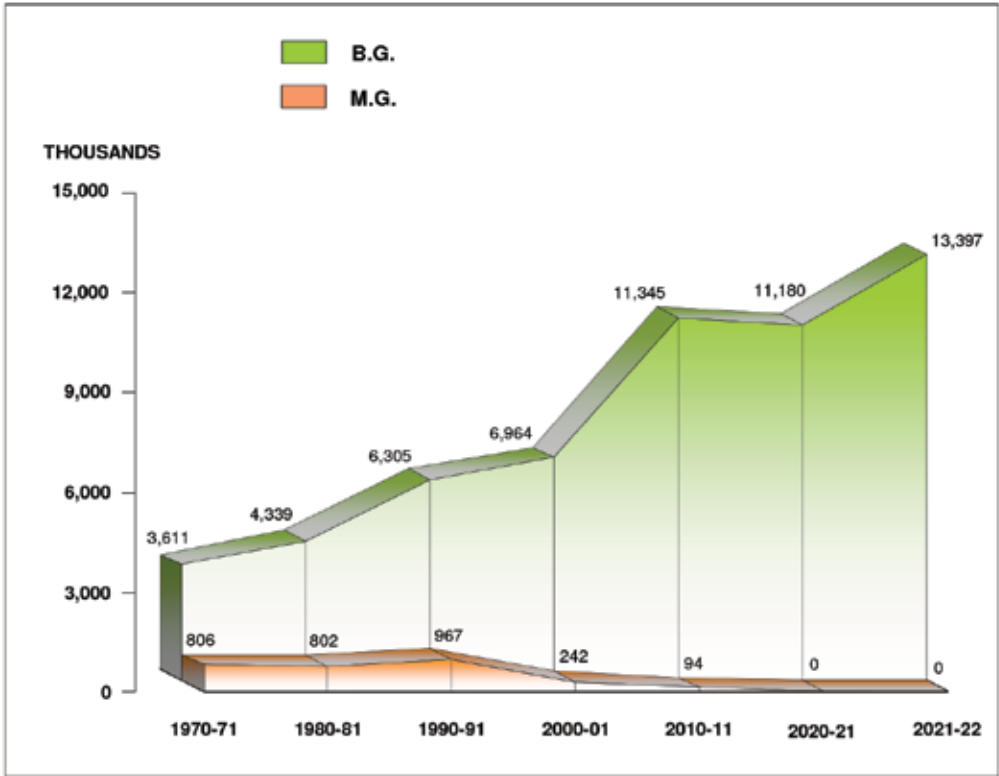
*Revised

I. Wagon turn-round (in days):

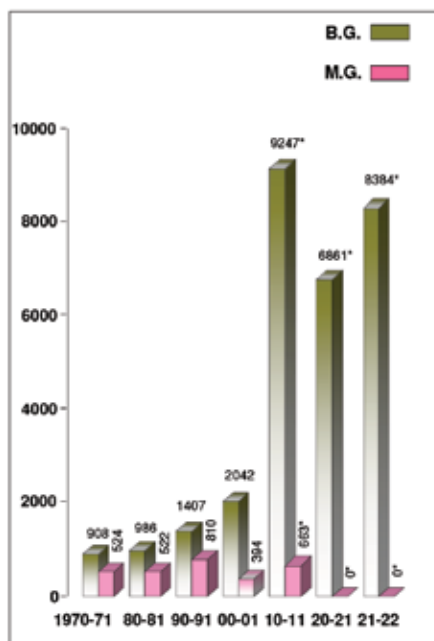
The turn-round time of wagons, representing operational cycle time is given in the following table:

Year	B.G.
1950-51	11.0
1960-61	11.2
1970-71	13.3
1980-81	15.2
1990-91	11.5
2000-01	7.5
2010-11	4.97
2019-20	5.30
2020-21	5.43
2021-22	4.74

NTKMS PER ANNUM PER ROUTE KM.

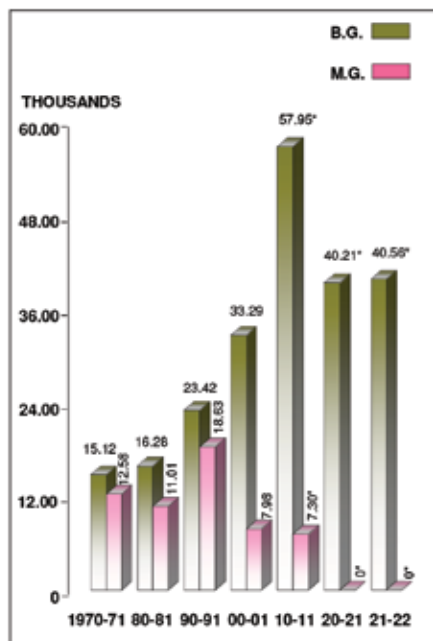


NET TONNE KILOMETRES PER WAGON PER DAY



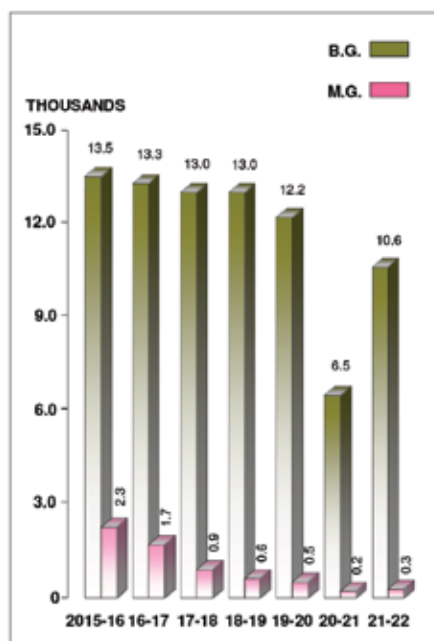
* In terms of eight wheelers

NET TONNE KILOMETRES PER ANNUM PER TONNE OF WAGON CAPACITY

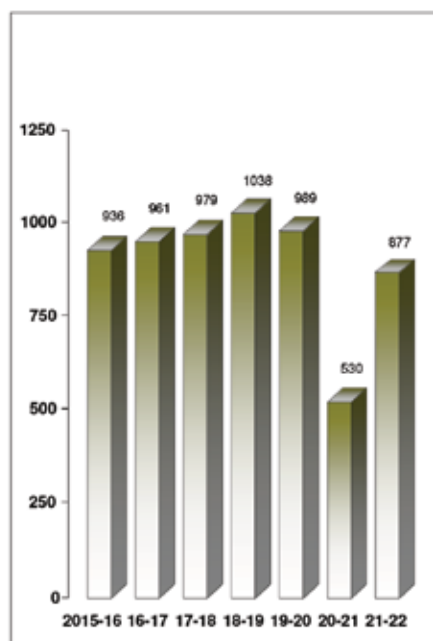


* In terms of eight wheelers

TRAIN KILOMETRES PER RUNNING TRACK KM



TRAIN KILOMETRES PER EMPLOYEE



Safety

There were 34 consequential train accidents in the financial year 2021-22 as compared to 21 accidents during the year 2020-21. Accidents per million train Kms, an important index of safety on IR, has remained at the same level of 0.03 in the year 2021-22 as compared to the previous year 2020-21

Comparative position of consequential train accidents during the last five years are as under:

Year*	Collision	Derailments	Level Crossing Accidents	Fire in trains	Misc. Accidents	Total	Accident Per Million Train Kms.
2017-18	3	53	13	3	0	72	0.06
2018-19	0	46	6	6	1	59	0.05
2019-20	5	40	1	7	1	54	0.05
2020-21	1	16	1	3	0	21	0.03
2021-22	2	26	1	4	1	34	0.03

*Excluding KRCL.

Casualties and Compensation:

The number of passengers injured or killed in train accidents and compensation paid in last five years are as under:

Year	No. of passengers #		Casualties per million passengers carried	Compensation paid in lakh*
	Killed	Injured		
2017-18	28	182	0.03	188.51
2018-19	16	90	0.04	641.15
2019-20	0	73	0.05	376.10
2020-21	0	0	0.03	104.38
2021-22	9	45	0.03	85.88

#Excluding Konkan Railway

*The compensation paid during a year relates to cases settled and not necessarily to the number of accidents/casualties during that year.

Causes of Consequential Train Accidents:

Out of 34 consequential train accidents which occurred on IR during 2021-22, 20 accidents were due to the failure of railway staff, 4 were due to persons other than Railway staff, 4 accidents were due to equipment failure, 3 were due to incidental factors, none was held responsible in 2 accidents and 1 consequential accident was attributed to sabotage.

Damage to Railway Property:

The cost of damage to railway property and duration of interruption to through communication caused by consequential train accidents during 2020-21 and 2021-22 are as under:

Year*	Cost of Damage (in Lakh)		Interruption to through communication (Hours)
	Rolling Stock	Permanent Way	
2020-21	1,765.85	477.52	839.43
2021-22	3,915.15	472.01	568.05

*Excluding KRCL.

Rashtriya Rail Sanraksha Kosh (RRSK)

‘Rashtriya Rail Sanraksha Kosh (RRSK)’ has been introduced since 2017-18 for a period of five years, in order to finance identified works of safety. Expenditure of ₹74,176.24 crore has been incurred out of RRSK till the end of 2021-22, with contribution from Gross Budgetary Support (GBS) of ₹69,732 crore.

Funds under RRSK are utilised for safety works relating to Traffic Facilities, Rolling Stock, Level Crossings, Road Over/Under Bridges, Track Renewal, Bridge Works, Signal and Telecommunication Works, other Electrical Works, TRD Works, Machinery & Plant, Workshops, Training/HRD, Passenger Amenities and Other Specified Works.

NITI Aayog has appreciated Railways’ progress on safety and implementation of RRSK and held that safety indicators have shown improvement after implementation of RRSK.

On the recommendation of NITI Aayog, the Government has agreed to extend the currency of RRSK for another five year term beyond 2021-22, with contribution of ₹45,000 crore from GBS. The Fund is in operation in 2022-23 with a provision of ₹12,000 crore in BE 2022-23

Measures to Improve Safety

- **Safety Focus:** In order to reduce accidents caused by human errors, a multipronged approach with focus on introduction of newer technologies, mechanization of maintenance, early detection of

flaws etc. to reduce human dependence in the first place, along with upgrading the skills of human resources, were the prime drivers for accident prevention.

- **Periodical Safety Audits:** Periodical Safety Audits of different Divisions by multi-disciplinary teams of Zonal Railways as well as Inter-Railway Safety Inspections were conducted on regular basis. During the year 2021-22, 18 Inter-Railway Safety Audits and 70 Intra-Railway Safety Inspections were carried out.
- **Training facilities:** Refresher training was imparted to 1,62,925 Non-Gazetted employees during the year 2021-22.

Measures to Avoid Collision

To enhance safety in train operations and make it efficient, Modern Signalling Systems comprising of Panel Interlocking/Route Relay interlocking /Electronic Interlocking (PI/RRI/EI) with Multiple Aspect Colour Light Signals (MACLS) are being progressively provided. As on 31.03.2022, 6,236 stations (covering about 97% of interlocked Broad Gauge stations) on Indian Railways have been provided with such systems, replacing the obsolete Multi Cabin Mechanical Signalling System, thus optimizing operational cost involved in its operation as well as enhancing safety by reducing human intervention.

Complete Track Circuiting: To ensure track occupation verification, 34,688 nos. of track circuits have been provided up to 31.03.2022 covering 'A', 'B', 'C', 'D Special' and 'E Special' route. Total 6,236 stations (97%) have been provided with complete track circuiting over Indian railways.

Block Proving by Axle Counter (BPAC): To enhance safety and improve mobility, automatic verification of complete arrival of train at a station is ensured by BPAC, i.e. Block Proving by Axle Counter, which is being provided at stations having centralized operation of points and signals. As on 31.03.2022, Block Proving by Axle Counters (BPAC) have been provided on 6,003 block sections.

Intermediate Block Signaling: Provision of Intermediate Block Signalling (IBS) has proved very useful in enhancing line capacity without extra recurring revenue expenditure in form of operating manpower and amenities required while developing and operating a block station. As on 31.03.2022, Intermediate Block Signalling has been provided in 666 block sections on Indian Railways.

Automatic Block Signalling: For augmenting Line Capacity and reducing headway on existing High Density Routes on Indian Railways,

Signalling provides a low cost solution, in the form of Automatic Block Signalling. As on 31.03.2022, Automatic Block Signalling has been provided on 3,549 Route Km.

Advance Train Protection System: Provision of Automatic Train Protection (ATP) System is a desirable Signalling requirement to reduce consequences due to Signal Passing At Danger (SPAD) & over speeding. Presently Gatiman Express is running at 160 Kmph on New Delhi – Agra section of 200 Route Km where European Train Control System Level-1 ATP System has been provided by the Railway.

RDSO, along with three Indian OEMs, has developed India's own ATP System, name KAVACH (Train Collision Avoidance System). The system has been provided on 1445 Route Km of Indian Railways, on South Central Railway.

KAVACH has also been sanctioned as part of Mission Raftar to upgrade the speed on New Delhi – Mumbai and New Delhi – Howrah sections up to 160 Kmph.

Further, KAVACH works have been sanctioned covering High Density Network (HDN) and other than HDN routes of Indian Railways.

Centralized Traffic Control (CTC): It is a computer based system which facilitates control and management of multiple Signalling installations covering a number of stations from a single location. It also provides a real time simulation of railway traffic centrally helping in real time traffic planning for punctual train operations. Controllers can manage train movements directly from CTC centre on real time basis.

Centralized Traffic Control (CTC), covering 250 Route km of Double line section with 31 stations on Aligarh - Kanpur Route, has been operationalized.

Further works of CTCs on about 14,660 Route Km, including all HDN Routes, have been approved.

Train Management System(TMS): Provides real-time status of train positions, all train movements and a complete view of the section covered on a giant screen provided in the divisional control centre. Punctuality reports, rake and crew links, train graphs, and unusual occurrence reports are generated in the control office.

The overall display panel, known as the 'Mimic Indication Panel', is designed to present a detailed status of the system at a glance. It is expected that with commissioning of TMS/CTC projects, our controllers shall be able to efficiently manage train operations. Besides providing real time train running information in the control offices, passengers shall also be provided with accurate arrival/departure information at stations through

automatic working of the Passenger information System at Stations. This system has been provided on Suburban sections of Mumbai on Western & Central Railways and Howrah of Eastern Railway. Similar system shall also be provided at Khurda Road in East Coast Railway and Sealdah in Eastern Railway.

Interlocking of Level Crossing Gates: As on 31.03.2022, Indian Railways have interlocking with Signals at 10,854 Level Crossing Gates, of which 277 have been provided in 2021-22, to enhance safety at Level Crossings. The number of interlocked level crossing gates has gone down in 2021-22 due to closure of several level crossing gates.

Sliding Boom at LC Gate: Provision of Interlocked Sliding Boom has become very effective in minimizing disruption to train services when Level Crossing Gates get damaged by road vehicles, especially in suburban areas. With provision of Sliding Boom Interlocking, Signalling System continues to function normally with minimum effect on train operation. 6523 Nos. of busy interlocked gates have been provided with Sliding Booms, as on 31.03.2022 in addition to lifting barriers and further busy gates are also being progressively covered.

Self-Sufficiency:

Signalling Workshop: Railway Signalling installations use a number of specialized equipment for smooth & safe running of trains. With upgradation of technology and shift towards electrical/electronic system of Signalling, the demand for these equipments has gone up. To attain self-sufficiency in meeting this increased demand, IR's Signal Workshops at Podanur on Southern Railway, Mettuguda on South Central Railway, Gorakhpur on North Eastern Railway, Howrah on Eastern Railway, Byculla on Central Railway, Sabarmati on Western Railway, Ajmer on North Western Railway, Kharagpur on South Eastern Railway and Ghaziabad on Northern Railway have been manufacturing items like Electric Point Machines, Tokenless Block Instrument, Double Line Block Instruments, Axle Counters, various types of Relays, etc.

Measures taken to strengthen the safety and reliability of Railway coaches to prevent fire in coaches:

- 1) Indian Railways is taking the following steps to further strengthen the safety and reliability of Railway passenger:
 - i) **Fire detection and suppression system in Pantry cars and Power cars:** Power Cars are more prone to fire due to presence of Diesel Alternator sets along with fuel tanks and other high voltage equipment. Pantry Cars are also more prone to fire due to cooking being carried out in these coaches. In this respect, automatic fire detection and suppression

systems are being provided in Power Cars and Pantry Cars.

Instructions have already been issued to Production Units in April 2017 that all newly manufactured Power Cars and Pantry Cars be provided with Fire detection and Suppression systems. For retrofitment in existing Power Cars and Pantry Cars, fitment has been completed in around 1545 Power Cars and 690 Pantry Cars. Further, 52 Power Cars (Total=1597 Power Car Coaches) and 54 Pantry Cars (total 744 Pantry Cars Coaches) have been provided with Fire Detection and Suppression System in 2022-23 (upto 01.08.2022)

- ii. Fire and Smoke Detection System In All Newly Manufactured AC Coaches:** With a view to improve fire safety in running trains, Automatic Fire and Smoke Detection Systems are being provided in AC coaches. The specifications for Automatic Fire and Smoke Detection System have been upgraded integrating the air brake system in the coaches with Fire and Smoke detection system. Instructions have already been issued to Production Units in June 2017 that all newly manufactured AC coaches be provided with Automatic Fire and Smoke Detection System. For retrofitment in existing AC coaches, sanction under RSP is available for 12,250 AC coaches, of which fitment has been completed in around 5738 AC coaches upto 31.03.2022. Further 870 AC coaches (Total-6508 AC coaches) have been provided with Fire and Smoke Detection System in 2022-23 (Upto 01.08.2022)
- iii. Introduction of Automatic Smoke Heat Detectors and Fire Alarm System in EMU/MEMU:** Automatic smoke/Fire detection and Alarm system is being provided in 3 phase MEMUs supplied by M/s BEML. Guidelines have been issued to provide Automatic smoke /Fire detection and Alarm system in Air conditioned and Non air conditioned EMU/MEMU. Railways have been advised to retrofit existing EMU/MEMU with such system. Further, instructions have been issued to PUs to turn out newly manufactured EMU/MEMU with Automatic smoke/fire detection and Alarm system.
- iv. Improving fire Retardancy in Coaches:** Coaches are being provided with fire retardant furnishing materials, such as Fire retardant curtains, partition paneling, roof ceiling, flooring, seats and berths along with cushioning material and seat covers, Windows and UIC Vestibules etc. The specifications of these items are being upgraded from time to time as a part of continual improvement. In the specification of major furnishing items, now a new parameter related to fire retardancy (i.e. heat release rate) has been introduced, as per international norms.
- v. Provision of Fire Extinguishers:** Dry chemical powder type fire

extinguishers are provided in all Air-conditioned coaches, Second class-cum-guard and luggage van and Pantry cars. Instructions have been issued to Production Units to provide fire extinguishers in all newly manufactured non-AC coaches as well. Its provision in existing coaches is also being carried out by Zonal Railways.

2) Measures taken to strengthen safety and reliability of Railway coaches:

- i. Large scale proliferation of LHB coaches:** Ministry of Railways has decided upon large scale proliferation of LHB coaches, which are technologically superior, with features like Anti climbing arrangement, Air Suspension (Secondary) with failure indication system and less corrosive shell. These coaches have better riding and aesthetics as compared to the conventional ICF coaches. The Production Units of Indian Railways are now producing only LHB coaches from April 2018 onwards. The production of LHB coaches has continually increased during the years: 1469 coaches in 2016-17, 2480 coaches in 2017-18, 4429 coaches in 2018-19, 6277 coaches in 2019-20, 4323 LHB coaches in 2020-21 and 6291 LHB coaches in 2021-22.

Further, 1482 LHB coaches have been turned out in 2022-23 (till 1st August 2022). It is planned to manufacture 5896 LHB coaches in the year 2022-23.

- ii. Jerk Free Coach:** Balanced draft Gear is a double acting device for energy absorption during coupling and service. The device is designed to absorb the dynamic energy in both draw and buff modes with two sets of elastomeric pads. Based upon successful trial and feedback, it was decided to proliferate Balanced draft Gear to reduce jerks in all LHB and ICF design coaches.
- iii. Progressive use of Air Springs:** For enhancing safety and reliability of passenger coaches, the suspension systems are being redesigned with air springs at secondary stage capable to maintain constant height at variable loads. Air springs have been developed and are being fitted on all the newly built EMU & DMU coaches for suburban trains. Air springs have now been developed for mainline coaches as well and have been fitted on a large scale in newly manufactured coaches. Production Units have been advised to use Air springs in all newly manufactured LHB coaches.
- iv. Provision of Automatic door closure mechanism in coaches:** Provision of Automatic door closure mechanism has been planned on coaches to prevent accidental falling of passengers from running trains. Select variants of the main line coaches will be provided with Automatic door closure mechanism. Automatic door closure mechanism has also

been provided in the coaches of Tejas rakes running between Mumbai-Goa, Chennai-Madurai, Lucknow-New Delhi and Ahmedabad-Mumbai. Automatic door closure mechanism has also been provided in the coaches of Tejas sleeper rake of Agartala –Anand Vihar Rajdhani Express, which has been introduced in 2020-21. Further, 3 more Tejas Rajdhani Express trains/rakes have been provided with Automatic door closure mechanism.

Automatic coach entry doors have also been provided in the rakes of Vande Bharat train running between New Delhi - Varanasi and New Delhi –Shri Mata Vaishno Devi Katra.

Eleven air-conditioned EMU (Electric Multiple Unit) rakes with Automatic doors have been manufactured at Integral Coach Factory, Chennai for Mumbai, Western Railway. Integral Coach Factory /Chennai has also turned out coaches for Kolkata metro with Automatic door closure mechanism.

Further, instructions have been issued to Production Units to turn out all future Humsafar and Uday train coaches with Automatic Plug type doors (4 nos. per coach).

- v. **Provision of Double Acting Doors in Coaches:** Double Acting doors in coaches are two way swing AC compartment doors for easy evacuation of passengers. Such doors need to be provided in AC coaches so as to improve fire worthiness and enable passengers to quickly evacuate from the coach in the event of fire.

Measures to curb accidents at unmanned level crossings:

Various measures taken by Indian Railways to prevent accidents at level crossings, are as under:

Level Crossing: Level crossings are meant to facilitate the smooth running of traffic in regulated manner, governed by specific rules & conditions, Status of level crossings on IR as on 01.04.2022 is as under:

Total Number of level crossings	:	19,501
Number of manned level crossings	:	18,746 (96.1%)
Number of unmanned level crossings	:	755 (3.9%)

Interlocking of Level Crossing Gates: As on 31.03.2022, Indian Railways have 10,854 Level Crossing Gates interlocked with signals out of which interlocking was provided on 277 gates in 2021-22, to enhance safety at Level Crossings.

Bridge Inspection and management System: Modern Bridge Inspection techniques have been adopted, which include inspection by

drones, under water inspections, monitoring the water level with the help of water level system, 3D scanning of river bed etc.

Other Administrative Measures:

- **Constant Review of Safety Performance at Board's apex level** - Safety performance is invariably reviewed as the first item on the Agenda of Board Meeting at the apex level. All accidents are analyzed in detail so that remedial measures can be initiated.
- **Safety Review meeting with Zonal Railways** - Chairman and Board Members have been conducting Safety Review Meetings with General Managers and PHODs of zonal railways during their visits as well as through video conference.
- **Intensive Footplate Night Inspections** - Intensive Footplate Inspections, including night inspections have been conducted at the level of SAG officers, branch officers and supervisors in the field.
- **Regular Safety Drives & Awareness Campaigns** - Safety drives and awareness campaigns have been launched from time to time, covering the lessons learnt from recent train accidents so as to prevent similar accidents in future.
- **Disaster Management Plan and Standard Operating Procedures (SOPs)** - As per the provision of Disaster Management Act, 2005, Ministry of Railways has prepared Disaster Management Plan. All Zonal Railways and divisions have also prepared their Disaster Management Plans. These plans have detailed schemes for averting and handling various types of disasters affecting train operations. Apart from the above, Detailed Standard Operating Procedure have been made for preventing and handling fire in railway coaches to minimize loss of life and railway property. Also, a detailed protocol for handling train accidents has been prepared.
- **Mock Drills/Exercises** - For coordination and management during Disaster/major train accidents, Indian Railways have been conducting Mock Drills with the National Disaster Response Force (NDRF). Such drills are crucial to ensure full preparedness and to maintain operational readiness of the disaster response operation teams, institutional mechanisms, and the equipments. These drills are organized to test their readiness to be deployed within the shortest possible time. Apart from this, Zonal Railways conduct quarterly Mock drills in each division, utilizing the resources of Railways i.e. Accident Relief Trains (ARTs), Accident Relief Medical Vans (ARMVs), Breakdown Cranes etc. Shortcomings noticed and lessons learnt during the Mock drill are documented for corrective action and to improve SOPs.

The Network

Indian Railways (IR) is one of the world's largest rail networks with 68,043 Route Kilometres of route lengths as on 31.03.2022. Out of 68,043 RKMs, BG constitutes 65,093 RKMs (95.67%), MG 1,656 RKMs (2.43%) and NG 1,294 RKMs (1.90%). The growth of its Route length, Running and Track Kms since independence is as follows :-

Year	Route Kms.	Running Track Kms.	Total Track Kms.
1950-51	53,596	59,315	77,609
1960-61	56,247	63,602	83,706
1970-71	59,790	71,669	98,546
1980-81	61,240	75,860	1,04,480
1990-91	62,367	78,607	1,08,858
2000-01	63,028	81,865	1,08,706
2010-11	64,173	87,114	1,14,037
2016-17	66,918	93,902	1,21,407
2019-20	67,956	99,235	1,26,366
2020-21	68,103	1,00,866	1,26,611
2021-22	68,043	1,02,831	1,28,305

Zones /Headquarters	Route Kms.	Running Track Kms.	Total track Kms.
Central, Mumbai	4,189	6,840	9,104
Eastern, Kolkata	2,831	5,273	7,354
East Central, Hajipur	4,245	6,245	8,665
East Coast, Bhubaneswar	2,818	4,912	6,220
Northern, New Delhi	7,331	10,256	13,562
North Central, Allahabad	3,523	6,285	6,669
North Eastern, Gorakhpur	3,472	4,700	4,911
Northeast Frontier, Maligaon, (Guwahati)	4,304	5,043	6,779

North Western, Jaipur	5,679	7,913	8,323
Southern, Chennai	5,087	7,579	9,285
South Central, Secunderabad	6,471	9,454	11,379
South Eastern, Kolkata	2,743	5,423	6,518
South East Central, Bilaspur	2,489	4,081	5,419
South Western, Hubli	3,629	5,057	6,466
Western, Mumbai	6,176	8,335	10,641
West Central, Jabalpur	3,025	5,372	6,905
Metro Railway, Kolkata	31	63	105
Total	68,043	1,02,831	1,28,305

State-wise Route Kms./ Running Track Kms. /Total Track Kms.:

Following table shows Route Kms., Running Track Kms. & Total Track Kms. of railway lines across various States/Union Territories at the end of 2021-22.

State/Union Territory	Route Kms.	Running Track Kms.	Total Track Kms.
Andhra Pradesh	3,969	6,441	8,050
Arunachal Pradesh	12	12	26
Assam	2,571	2,895	3,888
Bihar	3,825	5,417	6,834
Chhatisgarh	1,170	2,316	3,040
Delhi	184	346	706
Goa	69	83	124
Gujarat	4,960	6,231	7,849
Haryana	1,712	2,641	3,239
Himachal Pradesh	,312	317	376
Jammu & Kashmir	298	372	499
Jharkhand	2,591	4,502	6,132
Karnataka	3,596	5,190	6,623
Kerala	1,047	1,749	2,106
Madhya Pradesh	5,188	8,172	10,090
Maharashtra	5,861	9,038	12,044
Manipur	13	13	18
Meghalaya	9	9	13

Mizoram	2	2	6
Nagaland	25	25	41
Odisha	2,720	4,754	5,832
Punjab	2,265	2,823	3,671
Rajasthan	6,046	8,569	9,573
Tamil Nadu	4,033	5,684	6,986
Telangana	1,913	2,810	3,360
Tripura	265	265	337
Uttarakhand	346	442	517
Uttar Pradesh	8,800	13,964	16,063
West Bengal	4,203	7,708	10,156
Union Territory			
Chandigarh	16	18	79
Pondicherry	21	23	27
Total	68,043	1,02,831	1,28,305

Note: The remaining States/Union Territories have no railway line.

With its more than 169 year old history, IR is a state-owned public utility of the Government of India under the Ministry of Railways.

As a national common carrier transporting passenger and goods over its vast network, Indian Railways has always played a key role in India's social and economic development. It is a cheap and affordable means of transportation for millions of passengers. As a carrier of bulk freight viz. ores and minerals, iron and steel, cement, mineral oils, food grains and fertilizers, containerized cargo etc., the importance of Indian Railways for agriculture, industry and the common man is well recognized. Indian Railways carried 9.64 million passengers and 3.88 million tonnes of freight each day during 2021-22.

IR, functioning as Ministry of Railways, is headed by the Minister for Railways. The apex body entrusted with the management of this mega enterprise is led by the Chairman & Chief Executive Officer (CEO), Railway Board. Members of the Railway Board include Member (Finance), Member (Infrastructure), Member (Traction & Rolling Stock) and Member (Operations & Business Development) who represent their respective functional domains. For administrative purposes, IR is divided into 17 Zones, each headed by a General Manager. Zonal Railways are further divided into smaller operating units called Divisions. There are 68 Operating Divisions in IR at present, each under a Divisional Railway Manager. In addition, there are a number of Production Units, Training Establishments, Public Sector Enterprises and other Offices working under the control of Railway Board.

Track and Bridges

As on 31.3.2022, the Indian Railways had			(in Kms.)
(i)	Route length	-	68,043
(ii)	Running Track length	-	1,02,831
(iii)	Total Trackage	-	1,28,305
The following works were carried out during 2021-22			
(i)	Track renewal	-	4,275
(ii)	Construction of New Line	-	288.55
(iii)	Gauge conversion from MG/NG to BG	-	635.91
(iv)	Track conversion from single to double line	-	1,983.08

New Lines:

During 2021-22, 288.55 Km of new lines have been completed on the following sections:-

Railway	Project	Section	Km.
Central	Ahmednagar - Beed Parli	Solapurwadi - Ashti	31.00
East Coast	Khurda - Balangir	Mahipur - Nuagaon	13.00
Northeast Frontier	Jiribam - Imphal new line	Vangaichungpao - Khongsang	43.00
	Dimapur - Kohima	Dhansiri - Sukhovi	16.50
	New Maynaguri - Jogighopa	Abhayapuri Assam - Bilasipara	48.00
Southern	Madurai - Tuticorin new line	Milavittan - Melmarudur	18.00
South Central	Bhadrachalam Road - Sattupalli	Bhadrachalam - Chandragonda	25.00
	Manoharabad - Kottapalli	Gajwel - Kodakandla	12.25
	Bhadrachalam Road - Sattupalli	Chandrugonda - Bavanapalem	15.10
	Akanapet-Medak	Akanpet-Medak	17.40
	Munirabad Mahbubnagar	Makthal - Maganur	13.30
South East Central	Kharsia - Dharamjaigarh	Gharghoda - Bhalumuda	14.00
South Western	Gadag - Wadi	Talkal - Sangnal	22.00
Total			288.55

Gauge Conversion:

During 2021-22, 635.91 Kms of track was converted from MG/NG to BG as detailed below:

Railway	Project	Section	Kms.
East Central	Sakri - Nirmali & Saharsa - Forbesganj GC	Raghopur - Lalitgram	20.00
	Kosi Bridge	Asanpur Kupaha - Nirmali	9.00
	Mansi - Saharsa - Purnea	Barharakothi - Biharganj	12.00
	Sakri-Nirmali & Saharsa - Forbesganj GC	Tamuria - Nirmali	22.00
	Jaynagar-Bardibas	Kurtha-Bijalpura	17.40
North Eastern	Pilibhit - Shahjahanpur	Shahbaz Nagar -Shahjahanpur	4.20
	Lucknow - Pilibhit	Mailani - Shahgarh	43.00
North Western	Mavli-Bari Sadri	Mavli - Bari Sadri	82.00
	Ahmedabad - Udaipur-Himmat Nagar GC	Dungarpur - Jay Samand	52.00
Southern	Madurai to Bodinayakanur GC	Andipatti to Teni C	17.21
South East Central	Chhindwara - Nainpur-Mandla Fort	Chourai - Seoni - Bhoma	52.00
Western	Ahmedabad - Botad	Sabarmati - Botad	166.10
	Dhasa - Jetalsar GC	Dhasa - Lunidhar	49.00
	Miyagam – Dabhoi - Samlaya	Dabhoi - Miyagam	32.00
	Dhasa - Jetalsar GC	Lunidhar - Jetalsar	58.00
	Total		635.91

Doubling:

During 2021-22, 1983.08 Kms of double/multiple lines track were completed as detailed below:

Railway	Project	Section	Kms.
Central	Jalgaon - Bhusaval 3rd line	Jalgaon - Bhadli 3rd line	11.51
	Pune - Miraj - Londa DL	Ambale - Rajewadi	4.72
	Pune - Miraj - Londa DL	Takari - Kirloskarwadi	8.48
	Daund - Gulbarga Doubling	Washimbe - Bhalwani	26.33
	Pune - Miraj - Londa DL	Kirloskarwadi - Amnapur - Bhilavadi	13.50
	Thane - Diva 5th & 6th line	Thane - Diva 5th & 6th line	19.00
	Daund Manmad doubling	Ankai-Ankai Killa	4.50
	Wardha-Balharshah 3rd line	Sonegaon-Hinganghat	17.00
	Pune - Miraj - Londa DL	Lonand-Salpa - Adarki	17.00
	Itarsi Nagpur 3rd line	Katol Kohli	25.00
	Bardhaman - Katwa & MMs	Katwa - Ganga Tikuri	10.36
	Azinganj - Bazar Sau	Karnasubarna - Chowrigacha	9.36
Eastern	Dankuni - Bhattanagar	Bhattanagar - Baltikuri	2.70

East Central	Munger Bridge	Ratanpur - Jamalpur	6.35
	Azinganj - Bazar Sau	Khagraghat - Karnasubarna	11.00
	Ramna - Singrauli DL	Paparakund - Magardaha	7.00
	Ranchi - Road - Patratu	Ranchi - Road - Arigada - Bhurkunda	16.00
	Garhwa Road - Ramna	Garhwa Taur - Garhwa link	9.50
	Katareah - Kursela	Katareah - Kursela (Mega bridge on river Kosi: 15x61.0 m OWG)	7.00
	Hajipur - Bachhwara	Shahpur Patoree - Sahdai Buzurg	12.40
	Jarangdih - Danea doubling	Dumri Bihar - Danea	11.00
	Garhwa Road RoR	Surface triangle	2.00
	Patna Ganga Bridge project	Patliputra - Pahleza	11.00
E Coast	Hajipur - Bachhwara	Hajipur - Akhaywatrai Nagar	11.00
	Sagauli - Valmikinagar DL	Sathi - Narkatiaganj	11.00
	Ramna - Singrauli DL	Wyndhamganj - Mahuriya	10.50
	Ramna - Singrauli DL	Karaila Road- Singrauli	13.00
	Jagdalpur - Kirandul Doubling	Dabpal - Gidam	11.00
	Raipur - Titlagarh Doubling	Belsonda Arang - Mahanadi	9.20
	Sambalpur - Talcher - Doubling	Jujomura - Charmal - Rairakhol	32.00
	Koraput - Jagdalpur	Chatariput - Jeypore	7.00
	Sambalpur - Titlagarh	Sambalpur - Hirakud	7.25
	Khurda Rd. Vizianagaram (Argul-Haripurgram) By Pass	Khurda byepass	3.20
Northern	Raebareli - Amethi Doubling	Jais - Fursat Ganj - Rupamau	19.78
	Rosa - Sitapur - Burhwal DL	Jangbahadur Ganj - Neri	24.00
	Raebareli - Amethi Doubling	Rupamau - Raebareli	6.34
	Utraitia - Raebareli doubling	Raebareli- Gangaganj	8.50
	Rajpura - Bathinda doubling	Rajpura - Daun Kalan	18.50
	Laksar - Haridwar (left over patch)	Laksar -Yard remodelling	1.90
	Rosa - Sitapur - Burhwal DL	Rosa - Neri	8.00
	Alamnagar - Utraitia Doubling	Alamnagar - Transport Nagar	10.00
	Rajpura - Bathinda doubling	Kaulseri - Sekha	28.40
	Jalandhar Pathankot Jammu Tawi	Madhopur - Kathua	7.50
North Central	Jhansi-Bina 3rd line	Jhansi- Babina	25.00
	Jhansi - Bhimsen doubling	Chaunrah - Malasa	19.14
	Jhansi - Bhimsen doubling	Nandkhas - Parauna	34.50
	Mathura - Palwal 4th Line	Chhata - Bhuteshwar	28.40
	Mathura Jhansi 3rd line	Bhandai - Dhaulpur	42.70
	Jhansi - Bina 3rd line	Bijrotha - Matatila	16.00
	Naini - Chheoki 3rd line	Naini - Chheoki	2.00
	Aunrihar - Jaunpur	Aunrihar - Dobhi	22.80
	Roza- Sitapur - Burhwal DL	Sitapur - Parsendi	17.00
	Varanasi- Prayagraj doubling via Madho Singh	Gyanpur Road - Handia Khas	25.20
North Eastern	Chhapra Ballia doubling	Sahatwar - Ballia	17.00
	Ballia - Ghazipur	Phephana - Karimuddinpur	20.98

Northeast Frontier	New Bongaigaon-Kamakhya via Goalpara	Nar Narayana Setu (Jogighopa Bridge)	2.29
	Ambari - Falakata - New Maynaguri	Jalpaiguri Rd - Y leg	5.70
	New Maynaguri - Gumanihat	Betgara - Kolaigram	23.00
	New Maynaguri - Gumanihat	Kolaigram - Gumanihat	24.14
	Digar - Hojai Doubling	Dharamtul - Kampur	32.50
	Digar - Hojai Doubling	Jagiroad - Dharamtul	18.80
	New Bongaigaon - Kamakhya via Goalpara	Pancharatna - Dudhnoi	28.10
North Western	Phulera Degana doubling	Degana - Borawar	38.00
	Degana - Raika Bag doubling	Degana - Merta Road	44.00
	Degana - Raika Bag doubling	Merta Road - Kharia Khangar	26.00
	Phulera Degana doubling	Borawar - Kuchaman City	20.00
Southern	3rd line Tambaram - Chengalpattu	3rd line Tambaram - Guduvan Cheri	11.00
	Madurai - Vanchi Maniyachchi -Tuticorin Doubling	Tattaparai - Milavittan	7.47
	Kankanadi - Panambur	Padil - Kulasekhara	4.22
	Madurai - Vanchi Maniyachchi -Tuticorin Doubling	Tulukapatti - Kovilpatti	33.00
South Central	Kazipet - Balharshah 3rd line	Kolanur - Potkapalli	8.00
	Vijayawada - bye - pass	CR bulb line at Vijayawada	1.50
	Secunderabad - Mahbubnagar DL	Umdanagar - Shadnagar	30.00
	Vijayawada - Gudivada - Bhimavaram DL	Vijayawada - Uppaluru	17.00
	Motumari By Pass line	Motumari By Pass line	2.10
	Guntur - Guntakal	Donakonda - Kurichedu	12.53
	Gooty - Dharmavaram doubling	Gooty - Kalluru	26.38
	Kazipet - Balharshah 3rd line	Manikgarh - Wirur	19.00
	Guntur - Guntakal	Edduladoddi - Maddikera	22.60
	Vijayawada-Gudur 3rd line	Talamanchi-Srivenkateswarpalem	24.80
	Secunderabad - Mahbubnagar DL	Divitipalli - Mahbubnagar	10.50
	Vijayawada - Gudivada - Bhimavaram DL	Bhimavaram - Narasapur	30.00
	Vijayawada - Gudivada - Bhimavaram DL	Bhimavaram Town - Aravalli	19.00
	Guntur - Guntakal	Kurichedu - Gundlakamma	11.50
	Vijayawada - Gudur 3rd line	Sri Venkateswarapalem - Kavali	12.20
	Secunderabad - Mahbubnagar DL	Gollapalli - Divitipalli	16.00
South Eastern	Monaharpur - Bondamunda	Bisra - Bondamunda	4.20
	Bondamunda - Ranchi	Lodhma - Balsiring	9.90
	Kharagpur - Adityapur 3rd line	Chakulia - Jhargram	29.20
	Rourkela - Jharsuguda 3rd line	Rajgangpur - Kalunga	16.50
	Rourkela - Jharsuguda 3rd line	Bamara -Tangarmunda	8.40
	Bondamunda - Ranchi	Lodhma - Karra	13.10

South East Central	Anuppur - Pendra Road	Anuppur - Nigaura	24.00
	Anuppur - Katni 3rd line	Jhalwara - Rupaund	13.50
	Raipur - Titlagarh doubling	Arang Mahanadi - Lakholi	5.77
	Bilaspur - Jharsuguda 4th line	Robertson - Jharadih	14.50
	Rajnandgaon - Nagpur 3rd line	Dongargarh - Paniajob	8.00
	Rajnandgaon - Nagpur 3rd line	Koka -Tumsar	20.00
	Rajnandgaon - Nagpur 3rd line	Darekasa - Bortalao	8.00
South Western	Hosapete - Hubballi - Vasco da-gama	Sanvordem - Madgaon	14.80
	Hotgi - Kudgi - Gadag DL	Hombal - Holealur	36.00
	Yelahanka - Penukonda	Devarapalle - Hindupur	10.70
	Arsikere -Tumakuru	Banasandra - Nittur	22.00
	Hotagi - Kudgi - Gadag DL	Gadag - Hombal	12.70
	Yelahanka - Penukonda	Hindupur - Penukonda	38.00
	Hubballi - Chikjajur	Haveri - Saunshi	50.00
West Central	Katni - Bina 3rd line	Bina - Malkhedi Khurai	17.97
	Katni - Bina 3rd line	Hardua - Rithi	15.13
	Katni - Singrauli Doubling	Deoragram - Majholi	8.00
	Bina - Kota doubling	Bina - Kanjiya	20.47
	Katni - Singrauli Doubling	Mahadiya - Singrauli	6.00
	Katni - Singrauli Doubling	Salhana - Pipariyakalan - Khanna Banjari	21.40
	Bina - Kota doubling	Motipura Chauki - Ruthiyai	18.00
	Katni - Singrauli Doubling	New Katni Jn - Katangikhurd	7.80
	Bina - Kota doubling	Bijora - Baran	13.00
	Bina - Kota doubling	Orr - Piprai Gaon	14.40
	Bina - Kota doubling	Bhonra - Bijora	25.70
	Bina - Kota doubling	Ashok Nagar - Orr	13.05
	Palanpur - Samakhiyali doubling	Chandisar - Bhildi	32.00
	Ratlam - Khandwa - Akola	Nimarkheri yard	2.00
Western	Viramgam - Samakhiyali	Wadharva - Maliya Miyana A Block	5.00
	Palanpur - Samakhiyali doubling	Palanpur - Chandisar	11.90
	Chittaurgarh - Nimach	Nimbahera - Bisalwaskalan	17.00
	Surendranagar - Rajkot	Daladi - Wankaner	12.16
	Doubling		
	Total		1,983.08

Gauge-wise Details:

Broad gauge, though forming 94.57% of the route, generated 100% of the freight output (NTKms) and 99.94% of the passenger output (Pkms).

Route length as on 31.03.2022 on each gauge, indicating double/multiple line, single line and electrified route, is given below:

Gauge	Single line			Double/multiple line			Grand Total
	Electrified	Non electrified	Total	Electrified	Non electrified	Total	
Broad (1676 mm)	23,528.52	13,512.84	37,041.36	26,865.82	1,186.17	2,8051.99	65,093.35
Metre (1000 mm)	-	1,655.43	1,655.43	-	-	-	1,655.43
Narrow (762 mm/ 610 mm)	-	1,294.02	1,294.02	-	-	-	1,294.02
Total	23,528.52	16,462.29	39,990.81	26,865.82	1,186.17	2,8051.99	68,042.80
%age to total RKM's							

Almost all Double/Multiple Track sections and Electrified Routes are Broad Gauge. Metre and Narrow Gauges are mostly single line and non-electrified. Between 1950-51 and 2021-22, traffic density (million GTKms. per running track km.) increased from 4.29 to 21.82 on BG.

Track Renewal and Maintenance:

During 2021-22, 4275.44 kms of Complete Track Renewal (CTR) units of track renewal was carried out. The year wise details of Track Renewal carried out and expenditure incurred thereon are as under:

Year	Gross expenditure (₹ in cr.)	Track Renewal done (kms)
2018-19	9,651.32	4,181
2019-20	9,390.55	4,500
2020-21	13,522.65*	4,363
2021-22	16,557.87	4,275
*Revised		

One Complete Track Renewal (CTR) unit comprises of one Km of Through Rail Renewal (0.5 CTR units) and one km of Through Sleeper Renewal (0.5 CTR units).

Track Upgradation:

The track constitutes the basic infrastructure of a railway system and bears the burden of coping with ever increasing traffic. Higher speed and heavy axle load operation of IR have necessitated up-gradation of the track structure. Several policy initiatives have been taken in order to modernize the track.

Track structure is upgraded at the time of renewals. Sleepers are being upgraded from wooden, steel and CST-9 to PSC (Normal/Wider Base) sleepers. Heavier section and high tensile strength 60kg 90UTS R260 rails are being used in place of 90R/52kg 72/90UTS rails. Similarly, long rail panels or welded rails are predominantly used in place of earlier fish plated joints. The sturdier turnouts using thick web switches are being provided on trunk routes and high

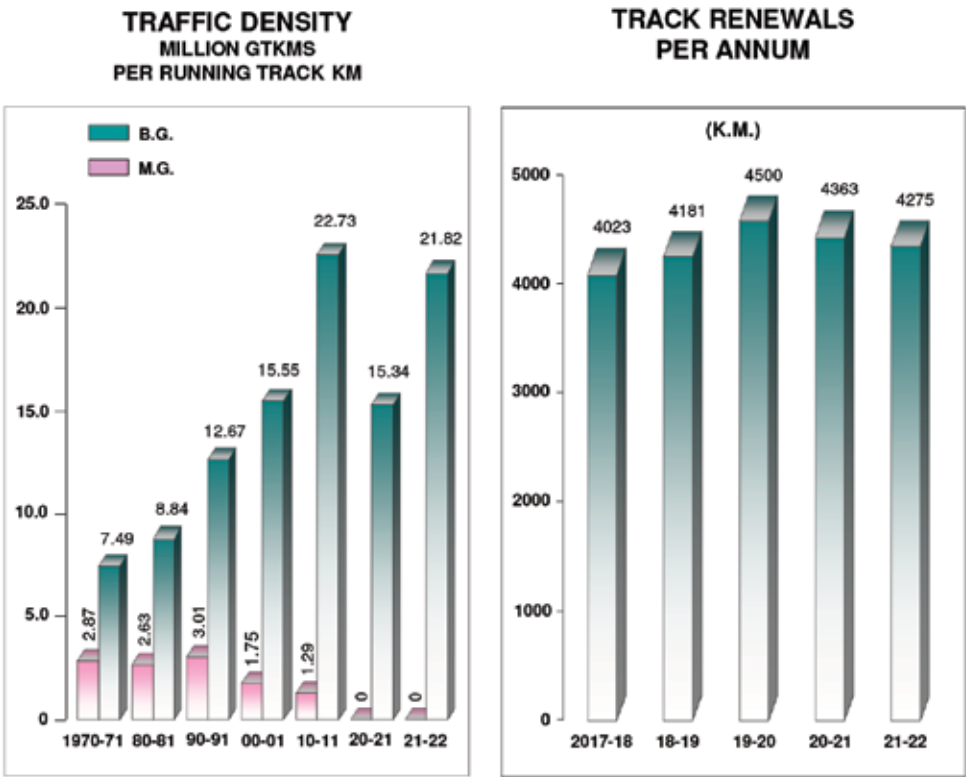
density routes. As on 31.03.2022, on BG main lines of IR, about 90% of the length is covered by long welded rails, 99% with PSC sleepers and 99% with 52kg/60kg 90 or higher UTS rails.

Welded Rails:

On most of BG track, rails have been converted into long welded rails. Short-welded rails of 39m length and single rails are limited to locations, where welded rails are not permitted on technical grounds. As on 31.03.2022, total length of track on main lines of Indian Railways was 95773.6 km out of which 86358.6 km was with long welded rails and 9,415 Km was with short-welded rails.

Bridges:

As on 01.04.2022, IR has 1,56,417 Bridges out of which 739 bridge are important, 12,590 are major and 1,43,088 are minor Bridges. During the year 2021-22, 1,541 Bridges are Strengthened/Rehabilitated/Rebuilt to enhance safety of train operation.



Level Crossings:

Level crossings are meant to facilitate the smooth running of traffic in regulated manner governed by specific rules & conditions. Status of level crossings on IR as on 01.04.2022 is as under:

Total number of level crossings	:	19,501
Number of manned level crossings	:	18,746 (96.1%)
Number of unmanned level crossings	:	755 (3.9%)

Indian Railway has decided to progressively eliminate the level crossings for the safety of road users and train passengers. During the year 2021-22, 867 Nos. of manned level crossings have been eliminated. All unmanned level crossings on Broad Gauge have already been eliminated on 31.01.2019.

Road Over/ Under Bridges:

To improve safety of train operation and reduce inconvenience to road users, level crossings are being replaced by Road Over/Under Bridges/Subways (ROBs/RUBs) in a phased manner based on the quantum of traffic.

During the year 2021-22, 184 ROBs and 810 RUBs/subways have been constructed under cost sharing, railway cost/accommodation works, Deposit/BOT term and by NHAI over Indian Railway.

Bridge Inspection and Management System:

Modern Bridge Inspection techniques have been adopted, which includes inspection by drones, under water inspections, monitoring the water level with the help of water level system, 3D scanning of river bed etc.

Land Management:

As on 31.03.2022, Indian Railways (IR) owns about 4.86 lakh hectares of land. About 90% of this land is under Railways' operational and allied usages such as laying of new lines, doubling, gauge conversions, track, stations, workshops, staff colonies, etc:-

S. No.	Description	Area (in lakh hectares)
1.	Track and structures including Stations, colonies, etc.	3.60
2.	Afforestation	0.43
3.	'Grow More Food' scheme	0.03
4.	Commercial licensing	0.04
5.	Other uses like pisciculture	0.13
6.	Encroachment	0.01
7.	Vacant land	0.62
	Total	4.86

Creation of various infrastructure facilities for development of future rail network largely depends on the availability of land. Therefore, preservation and meaningful interim use of railway land is the main objective of IR's land-use policy.

During 2021-22, Railway did mass plantation of 72 lakh trees. Railways have already finalized a model agreement with Ministry of Environment & Forests to be entered by Zonal Railways with State Forest Departments. Moreover, now instructions have been issued to all Zonal Railways to make provision of 1% in all estimates to environment related matter. This will help in meeting the cost of plantation. As such, Railways are making all efforts to plant more and more trees.

Besides, railway land is also licensed to railway employees belonging to Group 'C' and 'D' category under 'Grow More Food' scheme, for growing vegetables, crops etc.

Licensing of railway land is permitted for purposes directly connected with railway working. Plots of railway land at stations, goods sheds and sidings are licensed to other parties for stacking/storing of goods either received or to be dispatched by rail. Railway land is also leased to Kendriya Vidyalaya Sangathan to open Kendriya Vidyalayas. A part of this land is also leased to Central/State Governments/ Public Sector Undertakings on long term basis for public utility purpose like ROB/RUB, construction/ widening of roads, etc.

Railways have also taken up commercial use of such land which may not be required by the Railways for its immediate future use. Through an amendment to Railways Act, 1989, Rail Land Development Authority (RLDA), under the Ministry of Railways was constituted on 1st November, 2006 to undertake all tasks related to commercial development on railway land/air-space under the control of Ministry of Railways. 123 sites measuring 432.95 hectares (approx.) were entrusted to RLDA for commercial development upto 31.03.2022. Necessary action for development of these sites is under process by RLDA. Besides commercial development of vacant Railway land, RLDA has also been assigned the task of development of Multi Functional Complexes (MFCs).

Electrification

With a view to reduce the Nation's dependence on imported petroleum based energy and to enhance energy security to the Country, as well as to make the Railway System more eco- friendly and to modernize the system, Indian Railways have been progressively electrifying its rail routes.

In pre-independence period, electrification remained confined to 388 Route kilometers (RKMs) and it is only in the post-independence period that further electrification was taken up. Since then, there has been no looking back and the Indian Railways have slowly but steadily electrified its routes.

By March, 2022, electrification on Indian Railways has been extended to 50,394 RKMs out of the total Broad Gauge (BG) rail network of 65,093 RKMs including Konkan Railway. This constitutes 77.41% of the total BG Railway Network. On this electrified route, 74.5% of freight traffic & 78.8% of Passenger traffic is hauled with fuel cost on electric traction being merely 47% of the total traction fuel cost on Indian Railways.

With the progressive electrification, Diamond Quadrilateral routes along with its Diagonals have been electrified which connects metro cities of Delhi, Mumbai, Kolkata and Chennai on electric traction. Further, Indian Railways has planned to electrify balance BG rail routes expeditiously in mission mode.

II Progress of Railway Electrification

(a) The progress of Electrification since independence is tabulated below:

Year	Cumulative Electrified (RKM)
1951	388
1961	748
1971	3,706
1981	5,345
1991	9,968
2001	14,856
2011	19,008
2019	34,319
2020	39,329
2021	44,802
2022	50,394

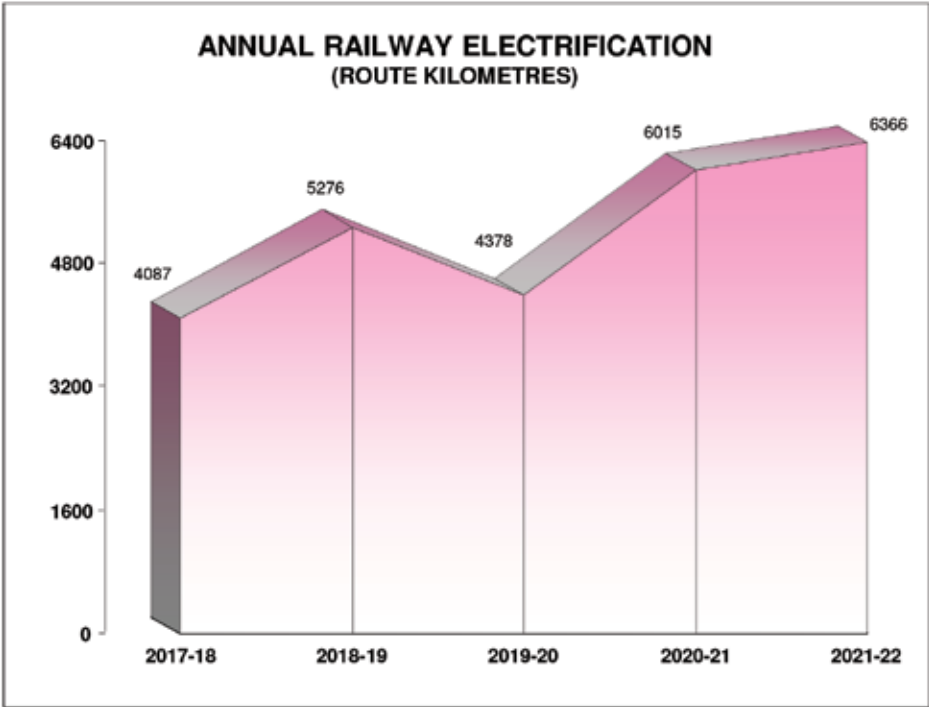
(b) During year 2021-22, 6,366 RKM has been electrified.

III Sections Electrified in (2021-22):

S.No.	Section	Railway	State	RKM
1	Mohol-Dudhani	CR	Maharashtra	96
2	Kuruduwadi-Pangri	CR	Maharashtra	56
3	Jejuri-Satara	CR	Maharashtra	89
4	Lonnand-Phaltan	CR	Maharashtra	26
5	Satara-Shenoli	CR	Maharashtra	68
6	Pandetola-Barahat Jn	ER	Bihar	20
7	Banka-Chandan	ER	Bihar	43
8	Deoghar-Dumka-Pandetola	ER	Jharkhand	122
9	Chandan-Jasidih	ER	Jharkhand	16
10	Bangaon-Petrapole	ER	West Bengal	4
11	Sitamarhi-Raxaul-Narkatiyaganj	ECR	Bihar	121
12	Saharsa-Garh Barauri	ECR	Bihar	16
13	Dauram Madhepura-Banmakhi	ECR	Bihar	43
14	Ghoswar-Vaishali	ECR	Bihar	30
15	Balangir- Bicchupali	ECoR	Odisha	14
16	Naungaon-Nayagarh	ECoR	Odisha	24
17	Sonipat - Gohana	NR	Haryana	36
18	Budgam-Baramulla	NR	J&K	49
19	Lohian Khas- Nakodar	NR	Punjab	32
20	Jalandhar-Nakodhar-Phillaur	NR	Punjab	63
21	Sultanpur-Ayodhya-Akbarpur	NR	Uttar Pradesh	119
22	Tapri-Shamli	NR	Uttar Pradesh	63
23	Raja Ka Sahaspur-Sambhal Hatim Sarai	NR	Uttar Pradesh	23
24	Chandausi-Harduaganj	NR	Uttar Pradesh	83
25	Barabanki-Faizabad	NR	Uttar Pradesh	99
26	Mahoba - Khajuraho	NCR	Madhya Pradesh	64
27	Birlanagar-Phoop	NCR	Madhya Pradesh	89
28	Khajuraho -Isha Nagar	NCR	Madhya Pradesh	57
29	Phoop-Udimor	NCR	Uttar Pradesh	12
30	Shikohabad-Mainpuri	NCR	Uttar Pradesh	51
31	Etawah-Farrukhabad	NCR	Uttar Pradesh	107
32	Barhan-Eta	NCR	Uttar Pradesh	59
33	Mau-Shahganj	NER	Uttar Pradesh	97
34	Nautanwa-Annadnagar-Sohratgarh	NER	Uttar Pradesh	92
35	Lakhimpur-Bankeganj	NER	Uttar Pradesh	45
36	Gonda-Behriach	NER	Uttar Pradesh	60
37	Shahjahnpur-Pilibhit	NER	Uttar Pradesh	84
38	Bhojipura-Kichha	NER	Uttar Pradesh	46
39	Rampur-Rudrapur	NER	Uttar Pradesh	45
40	Rudrapur-Lalkuan-Kichha	NER	Uttarakhand	40
41	Srirampur Assam-New Bongaigaon-Mirza	NFR	Assam	220
42	Kamakhya-Guwahati	NFR	Assam	6
43	New Guwahati - Jagi Rd	NFR	Assam	57

44	Katihar-Purnea	NFR	Bihar	27
45	New Jalpaiguri-Siliguri	NFR	West Bengal	8
46	Bhukarka-Ellenabad	NWR	Haryana	21
47	Hisar-Siwani	NWR	Haryana	29
48	Jaipur Yard	NWR	Rajasthan	4
49	Suratgarh-Suratgarh Thermal Power Station	NWR	Rajasthan	23
50	Beawar-Guriya & Ajmer-Durai	NWR	Rajasthan	50
51	Nohar-Bhukarka & Ellenabad-Hanumangarh	NWR	Rajasthan	52
52	Churu-Ratangarh-Benisar & Ratangarh-Sardarshahr	NWR	Rajasthan	165
53	Ringus-Sikar-Jhunjhunu	NWR	Rajasthan	120
54	Madar-Pushkar	NWR	Rajasthan	24
55	Siwani-Suratpura	NWR	Rajasthan	34
56	Jhunjhunu - Loharu	NWR	Rajasthan	56
57	Jodhpur-Luni-Marwar	NWR	Rajasthan	105
58	Minatchipuram-Palakkad	SR	Kerala	36
59	Kollam-Punalur	SR	Kerala	44
60	Pollachi-Podanur	SR	Tamil Nadu	41
61	Madurai-Manamadurai-Ramnathpuram & Manamadurai-Virudunagar	SR	Tamil Nadu	170
62	Salem-Vriddhachalam	SR	Tamil Nadu	136
63	Tiruchchirappalli-Karaikkudi	SR	Tamil Nadu	89
64	Palani-Minatchipuram	SR	Tamil Nadu	80
65	Bhimavaram-Narsapur-Aravalli	SCR	Andhra Pradesh	46
66	Pakala-Kalikiri	SCR	Andhra Pradesh	56
67	Kadiri-Tummanamgutta	SCR	Andhra Pradesh	53
68	Dhone-Kurnool town	SCR	Andhra Pradesh	54
69	Yerraguntla-Nandyal	SCR	Andhra Pradesh	122
70	Chitta-Khanpur	SCR	Karnataka	26
71	Lohagad-Washim	SCR	Maharashtra	45
72	Ankai-Rotegaon	SCR	Maharashtra	37
73	Umdanagar-Mahbubnagar	SCR	Telangana	86
74	Gadwal-Raichur	SCR	Telangana	58
75	Kohir-Chitta	SCR	Telangana	34
76	Pimpal khuti-Kosai	SCR	Telangana	44
77	Morthad-Nizamabad-Bodhan	SCR	Telangana	71
78	Bhadrachalam-Bavannapalem	SCR	Telangana	38
79	Aunlajori-Badampahar	SER	Odisha	33
80	Bhanjpur-Bangriposi	SER	Odisha	34
81	Balod-Dallirajhara	SECR	Chhattisgarh	24
82	Balaghat-Katangi-Tirodi	SECR	Madhya Pradesh	63
83	Chhindwara-Chourai	SECR	Madhya Pradesh	33
84	Nainpur-Palari	SECR	Madhya Pradesh	33
85	Alnavar-Londa-Tinai Ghat & Alnavar-Ambewadi	SWR	Karnataka	70
86	Chitradurga-Chikjajur-Hosadurga	SWR	Karnataka	66
87	Yesvantpur-Chikka Banavara-Nittur	SWR	Karnataka	91

88	Kalpurki-Wandal	SWR	Karnataka	20
89	Hulkoti-Hubballi	SWR	Karnataka	47
90	Yelahanka-Chikkaballapur	SWR	Karnataka	45
91	Gadag-Hole Alur	SWR	Karnataka	49
92	Ghataprabha-Kudachi	SWR	Karnataka	48
93	Palakkodu-Sivadi-Omalur	SWR	Tamil Nadu	75
94	Jhund-Kharaghoda	WR	Gujarat	23
95	Sikka-Kanalus-Wansjaliya	WR	Gujarat	89
96	Viramgam-Jatpipli-Chuli	WR	Gujarat	78
97	Surendranagar-Muli Road	WR	Gujarat	21
98	Bodeli-Chhota Udepur	WR	Gujarat	35
99	Palanpur-Radhanpur-Vaghpura	WR	Gujarat	139
100	Mahesana-Patan-Bhildi	WR	Gujarat	90
101	Bhatia-Okha	WR	Gujarat	70
102	Dhola-Bhavnagar & Sihor-Palitana	WR	Gujarat	57
103	Samakhiali-Padampur-Lakhpat	WR	Gujarat	64
104	Asnoti-Thivim-Madure	KRCL	Goa	120
105	Karwar - Asnoti	KRCL	Karnataka	8
106	Ratnagiri-Madure	KRCL	Maharashtra	167
107	Kolkata Metro	Metro	West Bengal	4
Total				6,366



IV Important Railway Electrification Projects Completed during 2021-22:

S. No.	Section	Railway	State	RKM
1	Lonand-Phaltan	CR	Maharashtra	26
2	Pune-Miraj-Kolhapur	CR	Maharashtra	326
3	Rampurhat-Dumka, Bhagalpur-Dumka Incl Barahat-Banka, Jasidih-Dumka Incl Deoghar-Banka incl. Madhupur-Girdih	ER	Bihar, Jharkhand & West Bengal	361
4	Raxaul-Sitamarhi-Darbhanga-Samastipur	ECR	Bihar	188
5	Barauni-Katihar-Guwahati incl Katihar-Barsoi	ECR & NFR	Assam, Bihar & West Bengal	836
6	Akbarpur-Faizabad-Barabanki	NR	Uttar Pradesh	161
7	Bareilly-Chandausi-Harduanj incl. Chandausi-Moradabad	NR	Uttar Pradesh	199
8	Raja Ka Sahaspur-Sambhal Hatim Sarai	NR	Uttar Pradesh	23
9	Sonipat- Gohana- Jind	NR	Haryana	86
10	Delhi Sarai Rohilla - Rewari - Palanpur - Ahmedabad, incl. Kalol -Gandhinagar - Khodiyar and Alwar - Bandikui - Jaipur - Phulera	NR, NWR & WR	Delhi, Gujarat, Haryana & Rajasthan	1087
11	Birlanagar-Etawah	NCR	Madhya Pradesh	115
12	Shikohabad-Farrukhabad	NCR	Uttar Pradesh	158
13	Barhan-Etah	NCR	Uttar Pradesh	59
14	Gonda- Bahraich	NER	Uttar Pradesh	60
15	Shahanjahanpur-Pilibhit, Pilibhit-Tanakpur	NER	Uttar Pradesh & Uttarakhand	145
16	Hisar-Suratpura	NWR	Haryana	65
17	Hissar - Bhatinda - Suratgarh/Suratgarh Thermal Power Station	NWR	Haryana, Punjab & Rajasthan	328
18	Luni-Marwar	NWR	Rajasthan	72
19	Madar-Pushkar	NWR	Rajasthan	26
20	Rewari-Sadulpur-Hanumangarh	NWR	Haryana & Rajasthan	320
21	Sikar-Loharu	NWR	Rajasthan	122
22	Kollam-Punalur	SR	Kerala	44

23	Pollachi-Podanur	SR	Tamil Nadu	40
24	Salem-Vridachalam-Cuddalore Port	SR	Tamil Nadu	196
25	Gadwal-Raichur	SCR	Telangana	57
26	Lingempet Jagtiyal-Nizamabad	SCR	Telangana	95
27	Nandyal-Yerraguntla	SCR	Andhra Pradesh	123
28	Rupsa-Bangriposi	SER	Odisha	89
29	Tata-Badampahar	SER	Odisha & Jharkhand	89
30	Balaghat-Katangi	SECR	Madhya Pradesh	47
31	Tirodi-Katangi	SECR	Madhya Pradesh	15
32	Chikjajur-Bellary	SWR	Andhra Pradesh & Karnataka	184
33	Bengaluru-Omalur via Hosur	SWR	Karnataka & Tamil Nadu	196
34	Jhund-Kharagoda	WR	Haryana & Rajasthan	23
35	Rajkot-Sikka-Okha	WR	Gujarat	271
36	Mahesana- Patan-Bildi	WR	Gujarat	91
37	Roha-Thokur	KRCL	Maharashtra	738

Signal and Telecom

Signalling

To enhance safety in train operations and make it efficient, Modern Signaling Systems comprising of Panel Interlocking/Route Relay interlocking /Electronic Interlocking (PI/RRI/EI) with Multi Aspect Colour Light Signals (MACLS) are being progressively provided. So far till 31st March, 2022, 6,236 stations (covering about 97% of interlocked Broad Gauge stations) on Indian Railways have been provided with such systems, replacing the obsolete Multi Cabin Mechanical Signaling System, thus optimizing operational cost involved in its operation as well as enhancing safety by reducing human intervention.

Complete Track Circuiting: To ensure track occupation verification, 34,688 nos. track circuit have been provided up to 31.03.2022 covering 'A', 'B', 'C', D Special' and 'E Special' route. Total 6,236 stations (97%) have been provided with complete track circuiting over Indian Railways.

Block Proving by Axle Counter (BPAC): To enhance safety and improved mobility automatic verification of complete arrival of train at a station, Block Proving by Axle Counter (BPAC) is being provided at stations having centralized operation of points and signals. As on 31.03.2022, Block Proving by Axle Counters (BPAC) has been provided on 6,003 block sections.

Intermediate Block Signaling: Provision of Intermediate Block Signaling (IBS) has proved very useful in enhancing line capacity without extra recurring revenue expenditure in form of operating manpower and amenities required while developing and operating a block station. As on 31.03.2022, Intermediate Block Signaling has been provided in 666 block sections on Indian Railways.

Automatic Block Signaling: For augmenting Line Capacity and reducing headway on existing High Density Routes on Indian Railways, Signaling provides a low cost solution by provision of Automatic Block Signaling. As on 31.03.2022 , Automatic Block Signaling has been provided on 3,549 Route Km.

Automatic Train Protection System: Provision of Automatic Train Protection (ATP) System is a desirable Signalling requirement to reduce

consequences due for Signal Passing At Danger (SPAD) & over speeding. Presently Gatiman Express is running at 160 Kmph on New Delhi - Agra section of 200 Route Km where European Train Control System Level-1 ATP System has been provided by the Railway.

RDSO with three Indian OEMs has developed India's own ATP System named KAVACH (Train Collision Avoidance System). The system has been provided on 1,445 Route Km of Indian Railway on South Central Railway.

KAVACH has also been sanctioned as part of Mission Raftar to upgrade the speed on New Delhi - Mumbai and New Delhi - Howrah section up to 160 Kmph.

Further, KAVACH works have been sanctioned covering High Density Network (HDN) and other than HDN routes of Indian Railways.

Centralized Traffic Control (CTC):

It is a computer based system which facilitates control and management of multiple Signalling installations covering a number of stations from a single location. It also provides a real time simulation of railway traffic centrally helping in real time traffic planning for punctual train operations. Controllers can manage train movements directly from CTC centre on real time basis.

Centralized Traffic Control (CTC) covering 250 Route km of Double line section with 31 stations on Aligarh - Kanpur Route has been operationalized.

Further works of CTCs on about 14,660 Route Km including all entire HDN Routes have been approved.

Train Management System (TMS): TMS provides real-time status of train positions, all train movements and a complete view of the section covered on a giant screen provided in the divisional control centre. Punctuality reports, rake and crew links, train graphs and unusual occurrence reports are generated in the control office.

The overall display panel, known as the 'Mimic Indication Panel', is designed to present detailed status of the system at a glance. It is expected that with commissioning of TMS/CTC projects, our controllers shall be able to efficiently manage train operations. Besides providing real time train running information in the control offices, passengers shall also be provided with accurate arrival/departure information at stations through automatic working of the Passenger information System at Stations. This system has been provided on Suburban sections of Mumbai on Western & Central Railways and Howrah of Eastern Railway. Similar System shall also be

provided at Khurda Road in East Cost Railway and Sealdah in Eastern Railway.

Interlocking of Level Crossing Gates:

Indian Railways presently have interlocking with Signals at 10,854 Level Crossing Gates as on 31.03.2022, of which 277 have been provided in 2021-22 to enhance the safety at Level Crossings. The number of interlocked level crossing gates have gone down in 2021-22 due to closure of level crossing gates.

Sliding Boom at LC Gate:

Provision of Interlocked Sliding Boom has become very effective in minimizing disruption to train services when Level Crossing Gates get damaged by road vehicles especially in suburban areas. With provision of Sliding Boom Interlocking, Signalling System continues to function normally with minimum effect on train operation. 6,523 Nos. of busy interlocked gates have been provided with Sliding Booms as on 31.03.2022 in addition to lifting barriers and further busy gates are also being progressively covered.

Growth of deployment of Signalling on Indian Railways:

Item	As on 31.03.2022				
	March, 18	March, 19	March, 20	March, 21	March, 22
Panel Interlocking (Stations)	4,130	4,052	3,863	3,747	3,438
Route Relay Interlocking (Stations)	282	228	228	247	226
Electronic Interlocking (Stations)	1,358	1,606	1,927	2,206	2,572
PI/RR/El (Stations)	5,770	5,886	6,018	6,200	6,236
Block Proving by Axle Counter (Block sections)	5,058	5,363	5,663	5,805	6,003
Automatic Signalling (Route Kms)	2,901	3,039	3,309	3,447	3,549
Intermediate Block Signalling (Block sections)	532	574	602	628	666
Interlocked level Crossing Gates (Nos.)	11,006	11,375	11,639	11,710	10,854

Self-Sufficiency

Signalling Workshop: Railway Signaling installations use a number of specialized equipment for smooth & safe running of trains. With upgradation of technology and shift towards electrical/electronic system of Signalling, the demand for these equipments has gone up. To attain self-sufficiency in meeting this increased demand, IR's Signal Workshops at Podanur on Southern Railway, Mettuguda on South Central Railway, Gorakhpur on

North Eastern Railway, Howrah on Eastern Railway, Byculla on Central Railway, Sabarmati on Western Railway, Ajmer on North Western Railway, Kharagpur on South Eastern Railway and Ghaziabad on Northern Railway have been manufacturing items like Electric Point Machines, Tokenless Block Instrument, Double Line Block Instruments, Axle Counters, various types of Relays, etc. Year wise out-turn achieved by these S&T workshops are as under:

Year Wise out Turn Signal and Telecommunication Workshop:

Year	Out Turn in Lakhs
2017-18	25,749.21
2018-19	29,669.70
2019-20	32,385.90
2020-21	25,041.89
2021-22	31,300.00

Telecommunication

Telecommunication plays an important role in train control, operation and safety on IR. Indian Railways has set up a state of the art, nationwide telecom network for meeting its communication needs. RailTel, a Railways Central Public Sector Enterprise is successfully exploiting surplus capacity of IR Telecom network commercially.

As on March 2022, Indian Railways has about 62,652 Route Kilometers of Optical Fibre Cable (OFC) that is carrying Gigabits of traffic. Railways Control Communication which is quintessential for train operation and control is also being transferred to OFC system. This OFC network is also contributing significantly in building National Knowledge Network through RailTel. RailTel also provides RailWire Broadband services.

In line with “Digital India” initiative of Government of India, Railways have provided Wi-Fi Internet facility at 6,102 stations. Indian Railways is also using 1.52 VHF sets to ensure safety and enhance reliability in train operations.

To enhance the security of passengers & premises and to work as a strong deterrent to crime in station premises particularly those against women and children. Railway has planned to provide Video Surveillance System at 6,124 (All category except halt stations) stations on Indian Railways. Video Surveillance (CCTV) System has been provided at 861 stations till 31.05.2022. In addition, CCTV also provided at Railway Offices

& at all Divisional & Zonal Hospitals over Indian Railways.

Indian Railways have also rolled out Global System of Mobile Communication – Railways (GSM-R) based Mobile Train Radio Communication (MTRC). MTRC has already been provided on 2,728 Route Kms. Now Railways have decided to go for Long Term Evolution (LTE) System based MTRC to fulfill the data and voice needs.

Railways have also established their Multi-Protocol Level Switching (MPLS) based Next Generation Network (NGN) for voice traffic. This Next Generation Network (NGN) has been used to interconnect more than 100 exchanges of Railways carrying the administrative voice traffic. Common User Group (CUG) mobile phones have also been hired to enable communication while on move to enhance safety, reliability and productivity. Further Railways have decided to extend the CUG facility to all its employees.

Railways have been allocated dedicated 5 MHz Bandwidth in 700 MHz spectrum for captive Mobile Train Radio Communication Telecom (MTRC). Telecom also plays a major role in ensuring passenger comfort. For the convenience of passengers, Train Information Boards have been provided at 1,190 Stations, Public Address (PA) Systems at 5,159 stations and Coach Guidance System at 697.

As part of digital initiative of Government of India and to bridge digital divide, Wi-Fi facility has been provided at 6,100 stations as on 31.03.2022. Indian Railways have progressively been implementing e-Office application for paperless working in the office besides improving transparency and efficiency in the system. Till 31.03.2022, 216 locations including all zonal & divisional headquarters have been connected through e-Office & approx. 1.4 Lakh user accounts have also been created over Indian Railways.

Important Telecom assets are tabulated below:

S.No.	Installation	Units	As on 31.03.2021	As on 31.03.2022
1.	Optical Fibre Cable	Rkms	61,526	62,652
2.	Quad Cable	Rkms	62,818	63,844
3.	Railway Telephone Subscribers Lines	Nos.	3,45,374	3,45,374
4.	No. of Control Sections provided with Dual Tone Multiple Frequency (DTMF) control equipment	Nos.	325	325
5.	Mobile Train Radio communication System (Route kms.):			
	a. GSM (R) based	Rkms	3,445	2,728
	b. TETRA based	Rkms	53	53

6.	Public Address System	Nos. of STNs	4,752	5,159
7.	Train Display Boards	Nos. of STNs	1,147	1,190
8.	Coach Guidance System	Nos. of STNs	652	697
9.	VHF Sets			
	a. 5 Watt sets (Hand held)	Nos.	1,61,048	1,52,050
	b. 25 Watt sets (At Stations)	Nos.	10,331	8,283
10.	V SAT	Nos.	516	396
11.	Railnet Connections	Nos.	1,54,175	1,54,175
12.	UTS/PRS Circuits	Nos.	11,174	11,091
13.	FOIS Circuits	Nos.	2625	2,790
14.	Exchange Circuits	Nos.	2,045	1,819
15.	Wi-Fi at Stations	Nos. of STNs	5,969	6,100
16.	CCTV at Stations	Nos. of STNs	780	853
17.	e-Office (No. of Locations)	Nos. of Locations	171	216



Railway Track and Signalling System at NWR

Rolling Stock

Locomotives:

The size of IR's fleet of locomotive stock as on 31st March, 2022 consisted of 39 steam, 4,747 diesel and 8,429 electric locomotives. The number of locomotives, traction-wise, along with their average tractive effort is as follows:

Year	Number of locomotives				Tractive effort per loco (in kgs.)	
	Steam	Diesel	Electric	Total	B.G.	M.G.
1950-51	8,120	17	72	8,209	12,801	7,497
1960-61	10,312	181	131	10,624	14,733	8,201
1970-71	9,387	1,169	602	11,158	17,303	9,607
1980-81	7,469	2,403	1,036	10,908	19,848	10,429
1990-91	2,915	3,759	1,743	8,417	24,088	12,438
2000-01	54	4,702	2,810	7,566	29,203	18,537
2010-11	43	5,137	4,033	9,213	34,380	18,304
2019-20	39	5,898	6,792	12,729	39,037	16,454
2020-21	39	5,108	7,587	12,734	39,911	16,439
2021-22	39	4,747	8,429	13,215	40,553	16,053

Traction wise, average tractive effort per loco (Kgs.) for last four years is given below:

Year	Broad Gauge		Metre Gauge	
	Diesel	Electric	Diesel	Electric
2018-19	38,621	38,455	18,967	-
2019-20	38,777	39,257	18,963	-
2020-21	40,246	39,691	19,080	-
2021-22	39,899	40,912	18,998	-

Passenger Carrying Vehicles (PCVs) with aggregate seating capacity in different years and availability of Other Coaching Vehicles (OCVs) are shown below:

Year	EMU Coaches		Passenger Coaches Conventional Coaches		DMU/DHMU		Other Coaching Vehicles (Number+)
	Number	Capacity \$	Number @	Seating capacity	Number	Seating capacity	
1950-51	460	87,986	13,109	854,678	-	-	6,059
1960-61	846	150,854	20,178	1,280,797	-	-	7,415
1970-71	1,750	340,541	24,676	1,505,047	-	-	8,719
1980-81	2,625	500,607	27,478	1,695,127	-	-	8,230
1990-91	3,142	609,042	28,701	1,864,136	-	-	6,668
2000-01	4,526	859,701	33,258	2,372,729	142	13,884	4,731
2010-11	7,292	13,64,948	45,082	32,54,555	761	74,097	6,500
2019-20	11,439	20,72,843	57,121	42,11,550	1,795	1,57,012	6,611
2020-21	10,991	*19,51,169	*58,778	*43,00,547	1,965	*1,75,534	*7,949
2021-22	11,773	19,88,370	61,002	44,79,747	1,969	1,74,070	10,103
\$ Includes standing accommodation.							
+ Includes luggage vans, mail vans, parcel vans etc.							
@ Includes Rail Cars.							
* revised							

Wagons:

As on 31st March, 2022, the size of IR’s wagon fleet consisted of 3,18,896 units 70,555 covered, 1,76,574 open high-sided, 27,522 open low-sided, 25,946 other types and 18,299 brake vans/departmental wagons:

Year	Total wagons on line (In units)	Percentage of total number of wagons					Total
		Covered	Open high sided	Open low sided	Other types	Depart-mental	
1950-51	205,596	58.9	25.5	3.4	7.2	5.0	100
1960-61	307,907	57.3	25.5	2.5	10.6	4.1	100
1970-71	383,990	53.4	25.6	1.8	13.0	4.2	100
1980-81	400,946	53.3	28.3	3.2	11.8	3.4	100
1990-91	346,102	49.1	29.6	3.6	14.4	3.3	100
2000-01	222,193	34.1	41.0	3.6	17.5	3.8	100
2010-11	229,987	26.6	52.8	3.1	12.0	5.6	100
2019-20	2,93,011	22.9	58.0	6.0	8.1	5.1	100
2020-21	*3,02,663	22.3	56.1	*8.2	8.1	5.3	100
2021-22	3,18,896	22.1	55.4	8.6	8.2	5.7	100
* revised							

Carrying capacity per wagon on broad gauge and metre gauge are indicated below :

Year	All Gauges		Broad Gauge		Metre Gauge	
	Total number of wagons\$ (000)	Total capacity (Million tonnes)	Number\$ (000)	Average capacity (Tonnes)	Number\$ (000)	Average capacity (Tonnes)
1950-51	195	4.14	149	22.6	43	17.1
1960-61	295	6.30	207	23.1	83	18.0
1970-71	368	9.35	271	27.8	91	19.1
1980-81	387	11.14	299	30.6	83	23.0
1990-91	335	11.50	276	36.9	55	22.9
2000-01	214	10.19	199	48.7	14	34.4
2010-11	217	12.18	213	56.6	4	33.0
2019-20	278	17.43	277	62.8	0.9	32.2
2020-21	287	17.82	286	62.3	*0.9	*32.2
2021-22	301	18.53	300	61.7	0.8	32.4

\$ Excludes departmental service wagons and brake vans

* revised

Some of the major types of wagons plying on IR as on 31.03.2022 are shown below:

Types of Wagons fleet (BG)			
Types of Wagon	Units available	Tare weight (t)	Brief description
BOXNHS/M1	19,331	23.2	Bogie open wagon, air brake, high speed.
BOXNS	4,500	19.85	Bogie open wagon, air brake, high speed.
BOXNLW	2,299	20.41	Bogie open wagon, air brake, light weight.
BOXNCR	358	23.1	Bogie open wagon, air brake, made of corrosion resistant IRS M : 44 steel.
BOXNHA	785	23.17	Bogie open, air brake wagon of 22 t axle load with high side walls (higher than BOXN), designed for transportation of coal.
BOXNHL	75,346	20.6	Bogie open air brake, stainless steel wagon
BOX' N'/M1	36,249	23.2	High - sided bogie open wagon with cast steel bogie, high tensile couplers, Cartridge Tapered Roller Bearings (CTRB), air brake, etc. for movement of bulk commodities like coal, iron ore etc.
BOY	1,036	20.71	Standard Gondola wagon, air brake, to carry minerals / iron ore with an axle load of 22.9 t.
BCN/M1 / BCNA /M1	41,822	27.20 / 24.55	Bogie covered wagon, air brake fully riveted / welded construction for transportation of bagged cement, food grains, fertilizers, etc.

BCNAHS/M1	11,934	24.6	Bogie covered, air brake, all welded & riveted construction with High Speed bogie CASNUB – 22 HS BOGIE.
BCNHL	18,856	20.8	Bogie covered, air brake, micro – alloy (stainless steel wagon)
BRN	1,524	24.393	Bogie Rail wagon Heavy, air brake.
BRNA / HS	6,341	23.54	Bogie Rail wagon Heavy, air brake, High Speed bogie, riveted cum welded construction.
BRHNEHS	1,558	26.15	Bogie Rail wagon, air brake, high speed CASNUB BOGIE for engineering department.
BFNS	1,238	26.71	Bogie Flat, air brake wagon, high speed for transportation of H.R. coils, plates, sheets & billets loading.
BOST / HS	10,014	25.5	Longer BOXNHS, air brake, wagon for finished steel products.
BOBR/N / HS/M1	19,779	26.40/ 25.6 / 25.61	Bogie open rapid discharge air brake wagon for coal.
BOBYN	5,960	27.78	Bogie Hopper, air brake, bottom discharge wagon
BOBSN/M1	2,327	30.00	Bogie open air brake, side discharge wagon for iron ore.
BTPN	12,154	27.00	Bogie Tank wagon, air brake, for liquid consignments like petrol, naphtha, ATF and other petroleum products.
BTFLN	805	23.58	Bogie Tank wagon, air brake, with frameless body.
BTPGLN	390	41.6	Bogie Tank wagon, air brake, for carrying Liquified Petroleum Gas.
BLCA/BLCB/ BLCAM	18,320	19.1/ 18.00/ 18.00	Low Platform Container Flat wagon, 840 mm wheel diameter, AAR 'E' type centre buffer coupler and slack less draw bar system (privately owned)
BLLA/BLLB	1,625	19.1 / 19.00	Container Flat wagon, same as BLCA / BLCB, but with a Longer Platform of 45f t. (privately owned).

Repairs and Maintenance:

44 Loco sheds and 258 (BG=257 & MG=1) Carriage and Wagons sick lines and central repair depots provide repair and maintenance facilities for the entire fleet of rolling stock.

The number of units of rolling stock given periodic overhaul (POH) in railway workshops during the year are given in the following table:

Type of Rolling Stock (BG+MG)	Periodic overhaul (Nos.) undertaken during the year	
	2020-21	2021-22
Diesel Locos	156	47
Electric Locos	424	373
Coaches	24,295	27,224
Wagons	50,177	56,135

COFMOW

A robust maintenance and manufacturing set up is backbone for operations of trains and the need for creation of assets and the maintenance thereof in good fettle is of paramount importance.

Central Organisation for Modernisation of Workshops (COFMOW) was established under Ministry of Railways by Government of India for modernization of its maintenance and manufacturing units in 1979. Since its inception, it has been instrumental in taking up works for modernisation and upgradation in this niche specialized area of machinery and plants. COFMOW has acquired unmatched expertise in developing specifications for machine, plants and equipment meeting client needs and their procurement by the virtue of its vast experience spanning four decades, in the procurement of over 25,840 machines valued at ₹8,280 crore, catapulting it as a leading specialised organisation in this area. Today it is in a position to offer its services to those needing modernization or upgradation of their manufacturing, maintenance, training and other activities towards enhancing the productivity.

Another activity of, execution of composite turnkey projects for setting up of new workshops/works of expansion and augmentation has been added to the activities of COFMOW. Remarkable achievements have been made in this area.

To harness the advancements in the field of maintenance, it has been entrusted upon COFMOW, to take up projects towards adoption of array of latest technologies, e.g. online/condition monitoring of rolling stock with various equipment, aids and sensors. The activity has started getting traction for upgradation of maintenance setup.

Salient features:

- Bringing in state of the art technologies available worldwide in the field of M&P.
- Preparing, Upgrading and Compiling specifications of machines used in workshops, maintenance sheds and production units.
- Its continued efforts for indigenization have led to a vibrant machine tool industry in India.
- Executing Specialized technical projects involving up gradation of Railways rolling stock & way side equipment.
- Dedicated Purchase Organization under Indian Railways for Such Specialized Procurements

Key Milestones:

Year	Fund Utilization (₹in crore)	Contracts Awarded (₹in crore)
2020-21	703.43	823.45
2021-22	865.07	1,001.41

Composite Turnkey projects:

Completed

- Composite Works contract for Augmentation of production capacity for manufacturing of advanced LHB coaches at ICF/Chennai (₹127 crore).
- Coil Spring manufacturing facility at ICF/Chennai (₹83.88 crore).
- New Wheel and Axle assembly line at RWF/Bengaluru (₹49.42 crore).
- Setting up of Wheel Shop at Sanpada (₹33.64 crore).
- Augmentation of Wheel Shop capacity at Matunga/CR (₹62.3 crore).
- Augmentation of BG coaches POH capacity from 50 coaches to 100, Bhavnagar (₹62.95 crore).
- Modernisation & Augmentation of POH capacity to 150 wagons per month at Dahod Workshop/WR (₹62.3 crore).
- Setting up of facility for maintenance of Bio Digesters at Matunga, Central Railway (₹6.29 crore).

Under Progress

- Creation of BG Coach POH facilities at Motibagh/NGP (₹83.27 crore).
- Augmentation of Wagon POH capacity from 400 to 500 wagons per month, Raipur (₹121.55 crore).
- Setting up of Axle Forging Line, RWF/Bengaluru (₹311.54 crore).
- Supply installation and commissioning of M&Ps at WRS Badnera (₹40.51 crore).
- Setting up of wheel set maintenance facility at NKJ in WCR (₹72.24 crore).
- Creation of facility of Maintenance of LHB Coaches at Matunga/CR (₹96.24 crore).
- 3rd Axle Machining Line for RWF/Bengaluru (₹141.60 crore).
- Upgradation/Improvement in infrastructure and augmentation of maintenance capacity of LHB coach at Ajmer Workshop/NWR (₹24.15 crore).
- Upgradation/Improvement in infrastructure and augmentation of maintenance capacity of WRS Raipur/WCR (₹15.93 crore).

Other Projects in Pipeline

- Augmentation of production capacity at MCF/Raiberaly from 1000 coaches to 2000 coaches per annum (₹92 crore).
- Online Monitoring of Rolling Stock (₹542 crore).
- Bogie Assembly & Disassembly Line (₹81 crore).

Special Projects in new technology areas in hand

- Self-propelled Tunnel Rescue Crane (₹240 crore).
- Project Mission Raftar 'Raising speed of train to 160/200 kmph between NDLS-BCT & NDLS-HWH (₹465 crore).
- Machine Vision Based Inspection of rolling stock (₹1039 crore).
- Procurement of Hot Axle Box Hot Wheel Detector (₹140 crore).
- Smart Yard facilities at DDU/Mugalsarai (₹36 crore).
- Wheel Data Acquisition System (₹7.8 crore).
- Procurement of 18 Nos. Simulators (₹241 crore).

Traction

Electric and Diesel traction constitute the principal modes of traction on IR. The share of traffic in terms of Train Kms. and GTKMs for passenger and freight services hauled under different traction types over the years is given in the following tables:

Year	Percentage of Train Kms. by types of traction						
	Passenger				Freight		
	Steam	Diesel@	Electric		Steam	Diesel	Electric
			Loco\$	EMU			
1950-51	93	-	2	5	99	-	1
1960-61	91	-	2	7	94	5	1
1970-71	77	7	7	9	46	39	15
1980-81	49	25	14	12	18	62	20
1990-91	21.8	42.4	22.6	13.2	3	60.6	34.4
2000-01	-	56.2	31.2	12.7	-	43.5	56.5
2010-11	-	49.4	36.6	13.9	-	37.5	62.7
2019-20		43.0	45.4	11.5	-	35.2	64.7
2020-21		18.9	63.7	17.4	-	27.0	73.0
2021-22	-	28.8	62.2	9.0	-	24.4	75.6

@ includes DHMU & DEMU
\$ includes Rail Cars & Rail Buses

	Percentage of Gross Tonne Kms. by types of traction						
	Passenger				Freight		
	Steam	Diesel@	Electric		Steam	Diesel	Electric
			Loco	EMU			
1950-51	92.4	-	2.8	4.8	98.3	-	1.7
1960-61	91.9	-	2.7	5.4	90.5	8.1	1.4
1970-71	74.1	10.7	8.2	7.0	32.2	47.7	20.1
1980-81	41.2	33.0	17.2	8.6	9.0	67.0	24.0
1990-91	15.1	47.1	29.5	8.3	0.8	57.8	41.4
2000-01	-	52.8	40.2	7.0	-	40.2	59.8
2010-11	-	48.8	44.0	7.2	-	35.7	64.3
2019-20	-	39.4	54.7	5.9	-	32.7	67.3
2020-21	-	21.2	69.1	9.7	-	25.5	74.5
2021-22	-	26.6	67.7	5.7	-	23.1	76.9

@ includes DHMU & DEMU

Electric Traction:

Electric loco production:

CLW has turned out 486 High Horse power three-phase energy efficient electric locomotives in year 2021-22. A cumulative production of 965 electric locomotives has been achieved during 2021-22 utilizing the capacity of CLW, DLW & DMW.

Operation of trains with WAP-5/WAP-7 locomotive in push-pull mode:

In order to increase average speed of passenger trains, IR Railways has successfully introduced Push-pull operation (one locomotive in front of rake and one rake in rear of rake with all controls from front locomotive) in train no. 22221/22 between Mumbai-Delhi (CSMT-NZM) over Central railway Route. With the Push-Pull arrangement in this train, attaching / detaching of banker locomotive at ghat section between Kasara-Igatpuri is no more required. Average speed of train has also been enhanced and journey time has been curtailed by about 90 minutes. New Delhi-Mumbai and New Delhi-Kolkata Rajdhani trains are planned to be converted in Push Pull scheme. This will result in saving of 60-90 min in travel time.

Manufacturing of High Horse Power (9000 hp) Freight locomotives:

Enhancement of average speed of freight trains is one of the Mission of Indian Railways. At present Horse Power to Trailing Load ratio of freight trains is less than one which is just adequate. Thus average speed of freight trains on IR is only 24.7 kmph (ASS 2019-20) even after deployment of multi locomotives in heavy freighters. To the solution, IR has taken initiative and developed High Horse Power Freight electric locomotives (9000 HP) in-house successfully. The up-gradation is 'Make in India' initiative and only with the incremental increase in initial cost of locomotive. Eight such locomotives have been turned out from CLW and are under service.

New Era of Green Technology- HOG power supply:

As on 31st March 2022, 1149 electric locomotives have been provided with Hotel Load Converter for deployment in Head on Generation (HOG) enabled coaching rakes/trains. Further, Production units have been directed to produce all Passenger (WAP7) locos Hotel Load Converters. The main benefits of this system are supply of pollution free and cheaper power from OHE as compared to End on Generation (EOG) system besides other advantages like reduction of carbon emission, noise level and consumption of fossil fuels helping in protecting the environment.

Crew Voice/Video recording system (CVVRS):

Provision of Crew Voice & Video Recording system (CVVRS), similar to provision of black box in aeroplanes is being tried on electric locomotives for recording of cab voice & video and track side through microphones & cameras. Recording of crew communications & crew interactions that occurred immediately prior to the accident will provide assistance to identify & address the operational and human factors issues within a proactive safety management system. Procurement of 5000 & 500 CVVRS are being procured through CLW & DMW respectively. Subsequently it will be provided in all locomotives as a regular measure.

Electric locomotives for High Speed Train Operation:

In order to enable operation of passenger trains at a speed of 160 kmph, haulage capacity WAP5 electric locomotive has been increased by making MU of two WAP5 locomotives. By this arrangement, total traction power of MU locomotive has increased and can haul 22-24 coach train upto 160 kmph speed. This MU is equipped with 25kV jumper to enable its operation with single pantograph along with some other features such as provision of High speed cattle guard, H-type coupler, HOG operation etc for ensuring safety in high speed train operation.

Electric Loco Simulators for training of Loco Pilots:

With the increase in train speeds, density of traffic, number of automatic signal territories, type of signals, intensive training to running staff through modern teaching techniques is essential to minimize human error in train operation. Simulator is accepted worldwide as one of the vital tool for training of running staff to improve their response time, driving skills and train handling in various situations thereby enhances the safety and energy efficiency in train operation. At present 11 electric loco simulators are functioning on IR. 15 more electric loco simulators are under procurement through COFMOW.

Software for Loco Asset Management (SLAM):

A computer application 'Software for Loco Asset Management (SLAM)' has been successfully developed by CRIS for monitoring of electric locomotive performance and reliability. During Phase-I, the system was rolled out in two electric locos sheds namely Ghaziabad (NR) & Tuglakabad (WCR). In Phase-II, software is being proliferated in all electric loco sheds & trip sheds across IR. The application will help Indian Railways in the following:

- Sharing of data across IR electronically in standard formats on real time basis.

- Real time monitoring of electric loco under maintenance at all levels from anywhere.
- Improve reliability of locomotives through easy and automated monitoring.
- Repair cost & time optimization through benchmarking.
- Real time shed performance monitoring and redistribution of major equipment.

Diesel Traction

Auxiliary Power Unit (APU) - APU is a self-contained unit with a small diesel engine coupled with compressor and alternator for battery charging. It has its own set of controls, accessories and is integrated to the existing control system of locomotive. In APU System, Main Engine shuts down and small 25 HP Engine starts and charges batteries and air brake pipes, when locomotive idles for more than 10 minutes. The diesel engine of APU consumes only 3 liters of diesel per hour in comparison to 25 liters by the main engine of the locomotive. Expected savings per loco fitted with APU is `20 lakhs/year on account of savings in fuel oil only. This unit has also fitted in all the new diesel locomotives being manufactured at Marhowra plant.

Export of Diesel Locomotives - In view of the policy for complete electrification of Broad gauge routes, Indian Railway has stopped manufacturing new diesel locomotives for its own use at BLW and PLW plants. However, manufacture for non-railway customers (NRC) continues. Indian Railways has exported 04 nos. diesel locomotives to Mozambique having 12 cylinders 3000 HP engines.

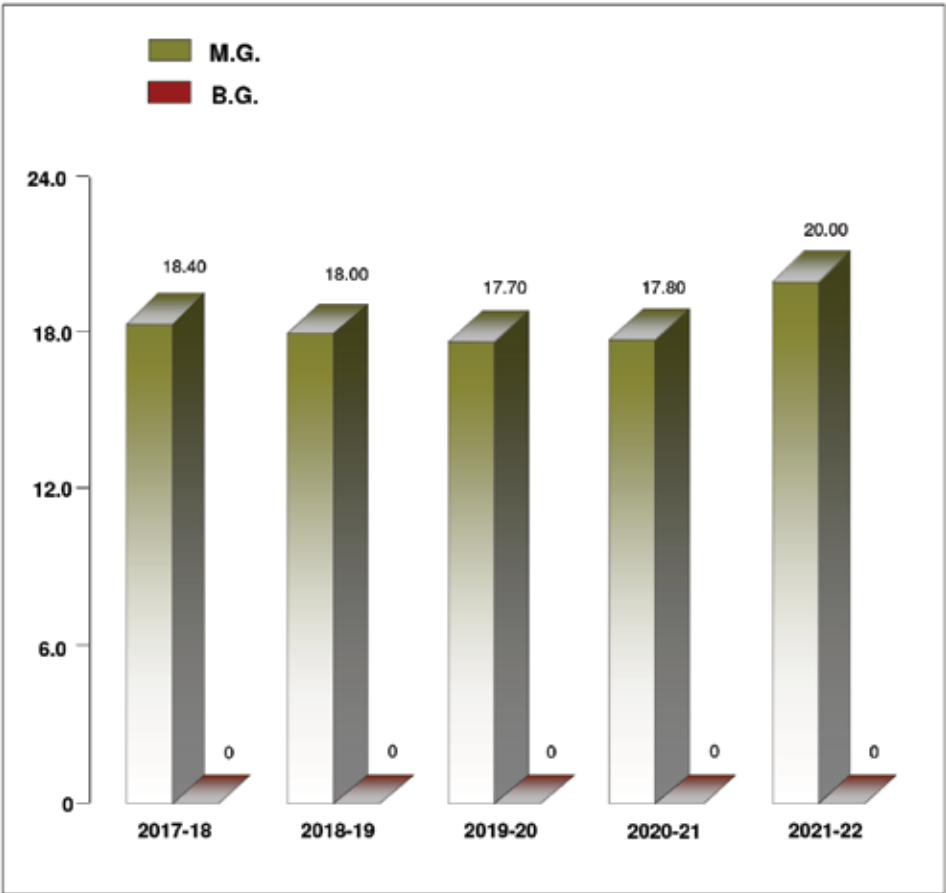
Steam Locomotive

Steam Locomotives are the icons of Indian Railways rich industrial heritage. The sound and smells of the gallant stalwarts of a bygone era are major tourist attractions. The following routes have currently been earmarked for running of steam locomotive hauled tourist trains:

- (i) Broad Gauge Steam service on demand between Delhi Cantt & Rewari and Garhi Hasru & Farukhnagar (Delhi Division)
- (ii) Broad Gauge Steam Tourist specials over selected routes of Southern Railway.
- (iii) Narrow Gauge Steam services over Darjeeling Himalayan Railway (DHR), now in its 143rd year and a UNESCO World Heritage Site.

- (iv) Meter Gauge Steam services over Nilgiri Mountain Railway (NMR), now in its 115th year and a UNESCO World Heritage Site.
- (v) Narrow Gauge Steam services over Kalka-Simla Railway (KSR) now in its 120th year and UNESCO World Heritage Site.
- (vi) Narrow Gauge steam services over Neral-Matheran on Matheran Light Railway (MLR), now in its 116th year.
- (vii) Narrow Gauge Steam services over Kangra Valley Railway (KVR), now in its 94th year.

**ENERGY CONSUMPTION (IN COAL EQUIVALENT)
GOODS SERVICES
(KGS. OF COAL/1000 GTKMS.)**



Personnel

The number of regular employees on Indian Railways as on 31.3.2022 stood at 12,12,882.

The table below shows the strength of railway employees under various groups, together with total expenditure incurred on them, for some selected years:

Year	Number@ of staff as on 31st March (in thousands)				Expenditure@ on staff (₹ in crore)
	Groups A&B	Group C	Group D	Total	
1950-51	2.3	223.5	687.8	913.6	113.8
1960-61	4.4	463.1	689.5	1,157.0	205.2
1970-71	8.1	583.2	782.9	1,374.2	459.9
1980-81	11.2	721.1	839.9	1,572.2	1,316.7
1990-91	14.3	891.4	746.1	1,651.8	5,166.3
2000-01	14.8	900.3	630.2	1,545.3	18,841.4
2010-11	16.9	1,079.2	235.9	1,332.0	51,776.6
2019-20	18.5	1,235.9	#	1,254.4	1,40,105.76
2020-21	18.6	*1,224.2	#	*1,242.7	*1,39,818.25
2021-22	18.3	1,194.6	#	1,212.9	1,51,754.02

*revised

@ Includes number of Railway Protection Special Force (RPSF) personnel and expenditure on them from 1980-81 onwards. These were not included in earlier years.

erstwhile Group D merged in Group C for 2019-20.

Number of personnel (Groups A&B) constitute 1.51% of the total strength, while Group C(including Group D merged in Group C) account for 98.49%. Of the employees in Group C 1.24 lakh (10.20%) are workshop employees and artisans and 11.95 lakh (89.80%) from other categories including running staff. Railway Protection Force/RPSF personnel totaled 67,337.

Representation of Scheduled Castes (SCs) and Scheduled Tribes (STs):

Representation of scheduled caste and scheduled tribe employees on IR (including MTP Railways) for the year 2021-22 as compared to the previous

year is given below:

	Number of SC Employees		Number of ST Employees	
	As on 31.03.2021	As on 31.03.2022	As on 31.03.2021	As on 31.03.2022
Group A	1,407 (12.51%)	1,468(13.61 %)	785 (6.98%)	780(7.23%)
Group B	1,168 (15.87%)	1,175(15.60%)	509 (6.92%)	497(6.60%)
Group C #	2,02,907 (16.45%)	1,96,647(16.46%)	94,376 (7.65%)	92,294(7.73%)
Grand Total	2,05,482 (16.41%)	1,99,290(16.43%)	95,670 (7.64%)	93,871(7.74%)
# Including erstwhile Group 'D'				
Note: Figures mentioned in brackets indicate the percentage of SCs/STs to total number of employees.				

A fully dedicated reservation cell exists each at the level of Ministry/ Railway/Zones/ Divisions/Workshops/Production Units, for dealing with the reservation matters.

Wage Bill:

Wage bill including pension etc. during 2021-22 was ₹1,51,754.02 crore registering an increase of ₹11,935.77 crore over the previous year. The average wage per employee was up by 11% from ₹11,24,418 per annum in 2020-21 to ₹12,51,004 per annum in 2021-22. The ratio of staff cost on open line (excluding payment towards pension and gratuity) to ordinary working expenses (excluding appropriation to DRF and Pension Fund) was 64%.

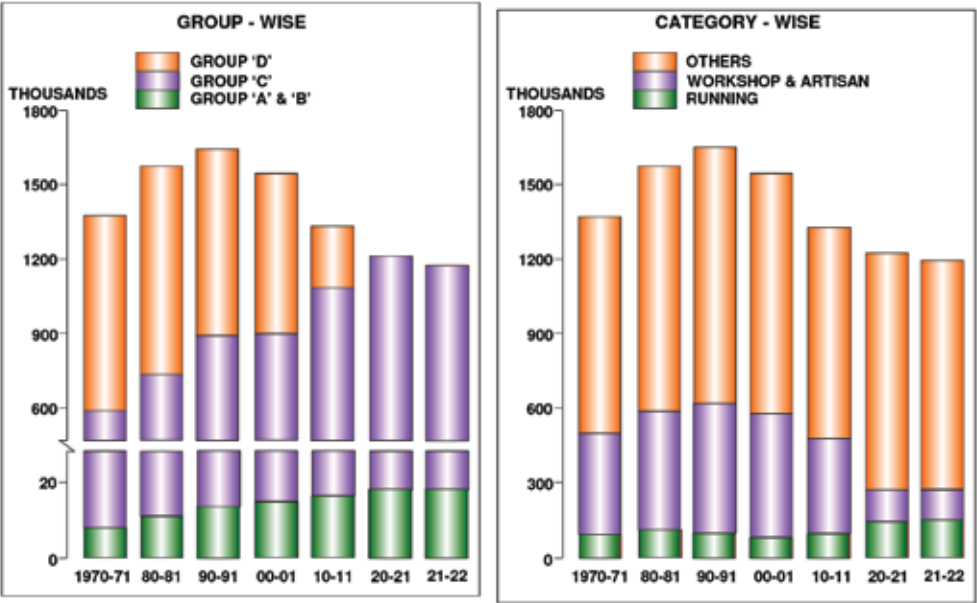
The average annual wage (excluding fringe benefits) per employee paid under various categories in 2021-22 is given below:

Category	Groups A & B (₹)	Group C (₹)	Group D (₹)	Total (₹)
Workshop and artisan	-	13,92,816	-	13,92,816
Running*	-	16,47,515	-	16,47,515
Others	-	11,93,206	-	11,93,206
Total	3,555,863	12,19,526	-	12,51,004
*Emoluments include running allowance.				

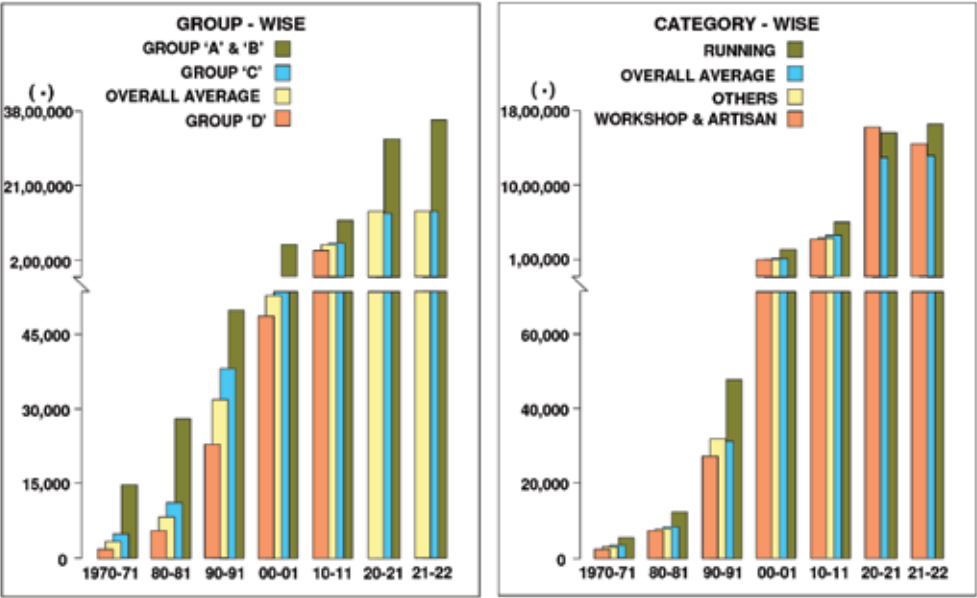
Productivity Linked Bonus:

In 2021-22, all non-gazetted Railway employees (excluding RPF/RPSF personnel) were sanctioned Productivity Linked Bonus (PLB) for 78 days. This benefitted an estimated 11,27,567 Railway employees. Further, Group 'C' and RPF/RPSF personnel have been sanctioned ad-hoc bonus equivalent to 30 (thirty) days' emoluments for the year 2021-22. The PLB and ad-hoc bonus both have been paid on an enhanced calculation ceiling of ₹7,000/-

NUMBER OF PERSONNEL



AVERAGE ANNUAL WAGE PER EMPLOYEE



p.m. Financial implication for PLB and ad-hoc bonus was approximately ₹1832.09 crore and ₹ 46.32 crore respectively.

Human Resource Development (HRD) and Manpower Planning: Training

There are different sets of Training Centres for Gazetted and Non-Gazetted Staff. These Training Centres located all over Indian Railways imparts various type of trainings i.e Probationary/Initial training (i.e before taking up a working post), Promotional training (i.e on promotion), Refresher training (i.e mid-career/on introduction of new developments in technology) and Specialized training (for Specialized courses). During 2021-22, around 4,75,000 non-gazetted employees have been provided different types of training i. e. initial, promotional, refresher and specialized.

To meet the challenges posed by changes/advancement in technology, quality of services and safety of operations, significant initiatives have been taken to train the human resources.

All safety category railway employees are given structured training at various stages of their career. Detailed training modules as per prescribed periodicity are available for each category at initial/promotional stages along with refresher courses and specialized training courses laying emphasis on more practical aspects which helps them in assimilating technology transferred and skill upgradation. These modules are updated keeping in view the technological changes in working practice. Safety Category staff like loco staff also undergo simulation training. Online training materials have also being made available to the trainees.

All frontline staff involved in train operations are imparted a special one day capsule training on Threat Perception & Emergency Response. Training module has also been formulated for running staff to include training Course on Fire Fighting & use of fire extinguishers, in initial and periodic refresher courses for Assistant Loco Pilots, AC Attendants and other running staff. Safety staff are given exclusive training on First Aid and on Disaster Management with the emphasis on Relief, Rescue and Rehabilitation (three 'R's). Yoga and Meditation lessons have been introduced in training centres with an aim to help railway men in coping with the stresses involved with their jobs. Some of the other Specialized Courses run by the Training Centres include Management Development Programme for Supervisors, Safety Oriented Course for Permanent Way supervisors, Air brake Operations Training for Guards and Drivers, Inspection and Rehabilitation of Bridges for Junior Engineers/Senior Section Engineers (Permanent Way)/ Bridge/Works.

Apart from in-house training, railway employees are also sent for foreign trainings under transfer of technology and are also provided inputs through leading training institutes within India.

Apprenticeship Training

Apprenticeship training is one of the most effective ways to develop skilled manpower for industry by using training facilities available in the establishments without putting any extra burden on exchequer to set up training infrastructure. Persons after undergoing apprenticeship training can easily adapt to industrial environment at the time of regular employment. The other advantages of apprenticeship training are as follows:

- Improved quality of training, experiential learning and enhanced employability.
- Providing apprentices a real chance to put skills into practice and helps them to gain confidence in working environment.

Indian Railways have also been awarded “CERTIFICATE OF APPRECIATION” for outstanding contribution towards engagement of apprentices.

Training Modules

In view of technological upgradation and changed job requirements, there was a need to review the existing training modules of all the departments. Therefore, the existing training modules of all the departments viz. Traffic, Commercial, Electrical, Civil, Mechanical, Personnel, Signal & Tele and Finance were reviewed, updated & uploaded on Railway’s website. These Training modules have been converted into online mode and the same have been uploaded.

Online Training

The training material for different categories of staff has also been converted in online mode in the form of powerpoint presentations, pdf documents and videos of lectures etc. These training materials can now be accessed by Railway employees even from his remotest place of posting. Most of the trainings are now being conducted in online/blended mode.

Railway Recruitment Boards:

During the financial year 2021-2022, the following activities/initiatives have been undertaken by RRBs:

- After declaration of result of the Computer Based Tests (CBTs) against Centralized Employment Notifications (CENs) No. 03/2019

(Ministrial & Isolated Categories) having 1923 vacancies, Skill Test, Stenography Test & Translation Test completed in two phases from 27.10.2021 to 31.10.2021 and 23.12.2021 to 02.01.2022.

- A High Power Committee of officials from Railway Board including Chairpersons of RRBs & other Railway Officials was constituted to redress the concerns raised by candidates after declaring the result of 1st Stage CBT against CEN No. 01/2019 (NTPC Categories) having 35281 vacancies. After of Committee's report, the decision taken by committee along with schedule of 2nd stage CBT was uploaded on RRBs websites on 10.03.2022 and had also been implemented by RRBs. Accordingly, revised results of 7,02,674 unique candidates declared on 30th - 31st March 2022 by RRBs.
- 1,15,67,284 candidates applied against CEN No. RRC 01/2019 which were advertised on 23.02.2019. In view of order dated 04.08.2021, in O. A. No. 1151 of 2019 by Hon'ble Central Administrative Tribunal, Allahabad, a modification link had been activated from 15.12.2021 to 26.12.2021 to those candidates whose applications had been rejected on the ground of invalid photograph and/or signature.
- Further, during 2021-2022, panels of 3188 candidates have been supplied to the Indenting Railway(s)/Production Unit(s) by 21 RRBs across India.

Staff Welfare

IR's welfare schemes cover a wide spectrum of activities in the areas of education, medical care, housing, sports, recreation and catering.

Staff Benefit Fund is an important channel for providing additional facilities to railway employees and their families in the spheres of education, recreation, medicare, sports, scouting and cultural activities. Dispensaries under the indigenous systems of medicine, viz. Ayurvedic and Homeopathic, are run with the help of this Fund.

Approximately 42.34% staff have been provided with railway quarters, 3,782 staff quarters were electrified during 2021-22.

Canteens served subsidized meals and refreshments to employees during the year at their work-places.

Cooperative societies of various types are functioning on Indian Railways. These Cooperative Societies are either registered with Central Registrar of Cooperative Societies, then Ministry of Agriculture, Department of Agriculture and Cooperation. Now Ministry of Cooperation or Registrar of

Cooperative Societies of the State concerned in which they are operating. The affairs of such societies are governed by Multi State Cooperative Societies Act 2002. Railway Administration has no jurisdiction over the administrative, financial, managerial, appointment & service matter of the employees of the society. Railways only provide certain facilities & concessions to these Cooperative Societies as per the provisions of Chapter XXIII of IREM Vol.II. There are 49 Thrift and Credit Societies, 112 Railway men's Consumer Cooperative Societies, 11 Labour Cooperative Societies and 3 Railway men's Housing Societies functioning on Indian Railways during 2021-22.

Indian Railway Medical Service:

Indian Railway Medical Service was primarily constituted to look after the health of Railway employees. It also provides medical facilities to the family members and dependents of the employee, retired employee & their family members and dependents as per pass rules.

With a sanctioned strength of 2,572 Medical Officers and 37,087 paramedical staff it is the largest industrial health services in the world. It is running 24x7 round the year, with 129 hospitals & 586 health units having a total of 14,000 indoor beds spread throughout the length & breadth of country. It attends to roughly one crore beneficiaries.

Besides curative services, Indian Railway Medical Service provides: Preventive, Promotive, Occupational & Industrial health, Public health services also. It also plays a significant role in monitoring the quality of water & food within Railway premises.

Ayushman Bharat Pradhan Mantri- Jan Arogya Yojana has been implemented the Railway Hospitals. As on date, 91 hospitals have been opened for AB PM-JAY beneficiaries.

Thirteen of our zonal hospitals are functioning as institutions for training for the very prestigious DNB program in most of the specialties and some super specialties.

Other activities carried out by IRHS are providing first aid to travelling passengers, attending Railway accidents, colony sanitation, and implementation of Food Safety Standards Act (FSSA), various National Health Programmes and providing post-graduation training & study program. Our health services inspire great confidence amongst the beneficiaries.

Covid treatment and vaccination is being done in Railway hospital, 98 PSA Oxygen generation plants have been installed and commissioned in

Railway hospital. More than 21 lakh beneficiaries have been given first dose of Covid vaccination and more than 19 lakh their second dose.

Performance Statistics (2021-2022)

Total OPD Cases attended	1,55,60,622
Total Indoor cases admitted	4,29,554
Total no. of surgeries performed	104,066
Percentage of man days lost due to sickness	1.4
No. of New Candidates examined for fitness	15,206
No. of employee examined under Periodical medical Examination (PME)	131,111
No. of food samples collected/ found faulty	2,493/175
Water sample for residual chlorine tested/ fit	11,89,673/10,96,577
Water sample for bacteriological tested/fit	69,063/65,639
No. of sick passengers attended by Railway Doctors	35,524
No. of Children immunized	8,821
No. of multipurpose health drives conducted	5,406
Total no. of persons examined in the multipurpose health drives above	2,00,885

Pension Adalats

In accordance with the directives of Department of Pension & Pensioners' Welfare (DOP&PW), instructions have been issued to Zonal Railways & Production Units to conduct Pension Adalat annually on Zonal level and quarterly at Divisional level to examine & settle the grievances of pensioners. Every efforts are made to settle these cases on the spot. A number of 3,783 cases were taken up in the Pension Adalat held in the month December, 2020.

Railway Minister's Welfare and Relief Fund

The Fund provides financial assistance and relief to Railway employees and their families in the times of distress. Voluntary contributions from the employees and Railway Women's Organizations constitute the primary source of the Fund.

Railway Schools

IR runs and manages one Degree College and 93 Railway Schools. These schools are being operated purely as a measure of Staff Welfare and they provide quality education at subsidized cost to children of Railway employees as well as non-Railway wards. In addition to this, 87 Kendriya Vidyalayas are also functional on Railway land, to caters to the needs of the students residing in the vicinity of these schools.

Promoting Hindi

In accordance with the provisions of the Official Languages Act,1963 and the Official Language Rules,1976 promotion of usage of Hindi is a continuing endeavour on Indian Railways. Till the end of 31st March, 2022, the total number of notified Railway Offices is 3605. In these Railway Offices, employees proficient in Hindi have already been given directions to transact cent-percent work in Hindi in the subjects specified under Official Language Rules. Besides this, Official Language officers of Railway Board office and Zonal Railways regularly inspect the Railway Offices to monitor the implementation of Hindi. In the year 2021-22, a total number of 40 inspections have been carried out by the second Sub-Committee of Parliamentary Committee on Official Language and has appreciated the use of Hindi in these Offices during inspections by Parliamentary Committee. In addition to this, Grih-Patrika 'Rail Rajbhasha' in Hindi is also published by Railway Board Office. Till now, 129 editions of the patrika have been published and circulated to all the Railway Offices. About 156 Hindi Grih-Patrikas, are also being published by Zonal Railways/Divisions etc. at their level.

Training in Hindi Typewriting, Hindi Stenography and Hindi Language

In addition to the Training Centres set up by the Ministry of Home Affairs, arrangement are also made by Indian Railways to provide in-service training in Hindi language, Hindi typing and Hindi stenography. The number of employees trained at the end of 2021-22 as compared to 2020-21 as follows:-

Activity	As on March 31st, 2021	As on March 31st, 2022
Working knowledge/ Proficient in Hindi	8,76,602	8,79,262
Hindi Typing	7,321	7,672
Hindi Stenography	2,863	2,597

Other activities

The existing policy of purchasing bilingual electronic equipments, like computers etc. is being followed. During 2021-22, 62,476 bilingual personal computers are available in various Offices of Indian Railways. Websites of the Zonal Railways including Railway Board are also available in bilingual form. In order to promote usage of Hindi in Railway Offices, 983 Codes/Manual and 6630 Station-Working Rules have been published bilingually. Besides this, 25,440 Local, Statutory and Standard Forms have been made available in bilingual form in Zonal Railways and Production Units including Railway Board. Presently, more than 17 lacs books in Hindi are available in 986 Hindi Libraries on Indian Railways and most of the libraries have been named after the names of famous litterateurs of Hindi.

Official Language Implementation Committees

To review the progress of the use of Hindi, total 968 Official Language Implementation Committees are constituted on the Zonal Railways, in Production Units etc. and meetings of these committies are being organized regularly. Besides this, Railway Board Official Language Implementation Committee has been constituted at Railway Board level also and its meetings are being organized regularly.

Railway Hindi Salahakar Samiti

In order to propagate the usage of Hindi in Ministry of Railways and Zonal Railways, Railway Hindi Salahakar Samiti is constituted under the Chairmanship of Hon'ble Minister of Railways, whose main objective is to give valuable suggestions to increase the use of Hindi. The 60th meeting of Railway Hindi Salahakar Samiti was organised under the Chairmanship of Hon'ble Minister of Railways on dated 25.05.2021.

Incentive Schemes for the use of Hindi

Various incentive schemes have been implemented to encourage railway personnel to work in Hindi. Prominent among them are the Kamlapati Tripathi Rajbhasha Swarn Padak award scheme, Rail Mantri Rajbhasha Rajat Padak award scheme, Rail Mantri Rajbhasha shield/trophy and other running shields award scheme, Rajbhasha Individual cash award scheme, Rail Mantri Hindi essay competition, Premchand award scheme, Maithilisharan Gupt award scheme, Lal Bahadur Shastri Takniki Maulik Lekhan award scheme, Rail Yatra Vritant award scheme, Zonal Railway/ All India level Hindi Essay, Elocution, Noting & Drafting competition, Akhil Rail Hindi Natyotsav Competition.

An Online workshop on 'Memory based translation tool Kanthastha' was organised on 17th June, 2021.

In order to promote the usage of Hindi in Ministry of Railways, Hindi week was organized from 13th to 17th September, 2021. During this period Hindi week was duly inaugurated on 13.09.2021 with lighting of lamp before Maa Saraswati. Thereafter, Hindi Diwas Message of Hon'ble Minister of Railways and Hon'ble Minister of Home Affairs was read by Director (OL) and Joint Director (OL) respectively.

Online Hindi Essay competition was organized on the topics of "Contribution of Non-Hindi Language speakers in the development of Hindi" and the "Role of Railway in field of Environment Protection" on 13th September, 2021.

Hindi Noting and Drafting competition and Hindi Elocution competition was organized during Hindi Week On 14 and 15 september, 2021 respectively.

Outstanding Achievements in Sports:

I. At International Level:

- i. Shri Ravi Kumar (NR) won Gold Medal, Ms. Sarita (NR) won Gold Medal, Ms. Vinesh (NR) won Gold Medal, Ms. Divya Kakran (NR) won Gold Medal, Shri Bajrang Poonia (NR) won Silver Medal, Ms. Sakshi Malik (NR) won Silver Medal and Shri Satyawart Kadian (NR) won Bronze Medal in the Senior Asian Wrestling Championship held at Almaty (Kazakhstan) from 12.04.2021 to 18.04.2021.
- ii. Ms. Jhilli Dalabehera (ECoR) won Gold Medal and Ms. Saikhom Mirabai Chanu (NFR) won Bronze Medal in the Senior Asian Weightlifting Championship held at Taskent (Uzbekistan) from 16.04.2021 to 25.04.2021.
- iii. Ms. Anupama (ER) won Silver Medal, Ms. Monika (CLW) won Bronze Medal and Shri Varinder Singh (ER) won Bronze Medal in the Senior ASBC Asian Elite Boxing (Men & Women) Championship held at Dubai (UAE) from 21.05.2021 to 01.06.2021.
- iv. 27 Indian Railway players participated in the XXXII Olympic Games 2020 held at Tokyo (Japan) from 23.07.2021 to 08.08.2021 and Ms. Saikhom Mirabai Chanu (Weightlifter / NFR) won Silver Medal, Shri Ravi Kumar (Wrestler / NR) won Silver Medal, Shri Bajrang Punia (Wrestler / NR) won Bronze Medal and Shri Amit Rohidas (Hockey player / ECoR) & Shri Nilkanta Sharma (Hockey Men player / WR) won Bronze Medal in the XXXII Olympic Games

2020.

- v. Shri Kapil (CLW) Archery player won Silver Medal in the 22nd Asian Archery Championship held at Dhaka (Bangladesh) from 13.11.2021 to 19.11.2021.
- vi. 13 Indian Railway Hockey (Women) players represented the country in the Asia Cup Women Hockey Tournament held at Muscat (Oman) from 21.01.2022 to 28.01.2022 and won Bronze Medal :

II At National Level:

During 1st April, 2021 to 31st March, 2022, Indian Railway Participated in total 53 National Championship. Out of which IR was semi-finalist in 03 Championships, 3rd Position in 02 Championships, Runners-up in 15 Championships and Winners in 21 Championships.

III Following Railway players have been honored with National Sports Awards during 2021-22:

S.No.	Name (Ms./Sh.)	Game	Award	Railway
I	Ms. Monika	Hockey	Arjuna Award	CR
II	Ms. Vandana Katariya	Hockey	Arjuna Award & Padma Shree	CR
III	Sh. Amit Rohidas	Hockey	Arjuna Award	ECoR
IV	Sh. Nilakanta Sharma	Hockey	Arjuna Award	WR
V	Ms. Pritam Siwach	Hockey	Dronacharya Award	NR
VI	Ms. Mithali Raj	Cricket	Major Dhyan Chand Khel Ratna Award	SCR
VII	Sh. Ravi Kumar	Wrestling	Major Dhyan Chand Khel Ratna Award	NR

Finance

Indian Railways financial results for 2021-22 compared with the previous year are tabulated below:

		(₹ in crore)
	2020-21	2021-22
Capital Investment	**3,34,239.78	*4,13,268.80
Investment from Capital Fund	53,449.91	53,449.91
Total	3,87,689.69	4,66,718.71
Passenger Earnings	15,248.49	39,214.39
Other Coaching Earnings	2,096.74	4,899.56
Goods Earnings	1,17,231.82	1,41,096.39
Sundry Earnings	5,938.61	6,067.96
Gross Earnings	1,40,515.66	1,91,278.30
Suspense	54.86	(-)71.83
Gross Traffic Receipts	1,40,570.52	1,91,206.48
Ordinary Working Expenses	1,35,844.51	1,56,506.34
Appropriation to Depreciation Reserve Fund	200.00	-
Appropriation to Pension Fund	523.00	48,100.00
Total Working Expenses	1,36,567.51	2,04,606.34
Net Traffic Receipts	4,003.01	(-)13,399.86
Miscellaneous Transactions	(-)1,455.53	(-)1,624.72
Net Revenue Receipts	2,547.48	(-)15,024.58
Dividend payable to General Revenues \$	0.00	0.00
Excess (+)/Shortfall (-)	2,547.48	(-)15,024.58
Percentage of Net Revenue to Capital Investment including investment from Capital Fund	0.66	(-)3.22
Operating Ratio (%)	97.45	107.39
Capital Investment (including investment from Capital Fund) per NTKM (in paise)	#525	507
# Revised		
* Excludes ₹19,527.63 crore of MTPs, ₹1,911.20 crore of Circular Railways, ₹16,026.70 crore of Udhampur-Srinagar-Baramulla Project (National Project), ₹11,954.00 crore of appropriation to SRSF, ₹56,617.40 crore investment in DFCCIL and others, ₹70,000.00 crore investment in RRSK and ₹32,957.03 crore investment in RSF. Includes ₹17,717.06 crore of Production Units.		
** Excludes ₹16,886.34 crore of MTPs, ₹1,911.10 crore of Circular Railways, ₹16,026.70 crore of Udhampur-Srinagar-Baramulla Project (National Project), ₹11,954.00 crore of appropriation to SRSF and ₹56,617.40 crore investment in DFCCIL and others. ₹45,000.00 crore investment in RRSK and ₹22,357.03 crore investment in RSF. Includes ₹17,041.72 crore of Production Units.		

Revenue:

Revenue from Freight accounted for 80.78% of Gross Earnings.

Passenger Earnings constituted 22.45% of the Gross Earnings, of which 3.49% was from Suburban Services, 95.49% from Express Long distance and 1.02% from Ordinary Short Distance traffic. Bulk freight like coal, ores, iron & steel, cement, foodgrains, fertilizers, POL products, limestone, dolomite, stones other than marble, salt and sugar contributed 90.32% of the total goods earnings, while commodities other than the above accounted for 8.40%. Miscellaneous realization like demurrage, wharfage, shunting and siding charges etc. made up the remaining 1.28%.

Balance Sheet:

A brief summary of Balance Sheet as on 31st March, 2022 compared with the previous year is given below:

	As on 31.03.2021	As on 31.03.2022	(₹ in crore) Variation
Assets			
Block Assets	6,70,725.78	8,09,918.59	1,39,192.81
Fund with Central Government			
(i) Reserve Fund	6,893.93	2,033.26	(-)4,860.67
(ii) Banking Accounts	62,324.04	66,931.54	4,607.50
Sundry Debtors	4,998.64	5,836.55	837.91
Cash in hand	703.98	623.17	(-)80.81
Total	7,45,646.37	8,85,343.11	1,39,696.74
Liabilities			
Represented by:			
Capital Investment	**4,06,883.88	*5,08,599.65	1,01,715.77
Investment financed from internal resources etc.	2,63,841.90	3,01,318.94	37,477.04
Total (i)	6,70,725.78	8,09,918.59	1,39,192.81
Reserve Fund	6,893.93	2,033.26	(-)4,860.67
Total (ii)	6,893.93	2,033.26	(-)4,860.67
Banking Accounts			
(i) Provident Fund	40,292.15	40,226.99	(-)65.16
(ii) Miscellaneous Deposits etc.	21,974.81	26,639.02	4,664.21
(iii) Loans and Advances	57.08	65.53	8.45
Total (iii)	62,324.04	66,931.54	4,607.50
Sundry Creditors etc.	(iv) 5,702.62	6,459.71	757.09
Total (i) to (iv)	7,45,646.37	8,85,343.11	1,39,696.74
* Excludes, ₹11,954.00 crore of appropriation to SRSF, ₹70,000.00 crore appropriation to RRSK and ₹32,957.03 crore appropriation to RSF			
** Excludes ₹16,886.34 crore of MTPs, ₹1,911.10 crore of Circular Railways, ₹11,954.00 crore appropriation to SRSF, ₹45,000.00 crore appropriation to RRSK and ₹22,357.03 crore appropriation to RSF .			

Cash Flow:**2021-22 (₹ in crore)****Acquisition of new assets and replacement of existing assets:**

Acquisition of new assets and improvement element in replacement of assets like replacement of assets	1,29,066.82	}	1,29,201.17
By replacement of assets	134.35		

Payments of interest on loans, repayment of loans and increase/decrease in Reserve Funds

Payments of interest on loan for Development Fund	0.00	}	(-)4,860.68
Repayment of loan for Development Fund	0.00		
Increase (+)/ Decrease (-) in Funds balances	(-)4,860.68		
Payment for Accident Compensation	0.00		
Total	1,24,340.50		

Finance for these requirements was provided from the following sources:**Internal sources:**

Contribution from Revenue/Capital to fund and interest occurring on the balances of the fund.	(-)2,930.03	}	42,669.97
Development Fund financed from Surplus	0.00		
Development Fund financed from General Revenue	0.00		
Capital Fund financed from surplus	0.00		
Capital Fund financed from Railway Revenue (for capital component of IRFC lease charges)	0.00		
Railway Safety Fund financed from surplus	0.00		
Debt Service Fund financed from Surplus	0.00		
Railway Safety Fund financed from General Revenues(from Central Road Safety Fund)	20,600.00		
Spl. Railway Safety Fund financed from General Revenues	0.00		
RRSK Finance from General Revenue (Capital)	15,000.00		
RRSK Finance from RSF	10,000.00		
RRSK Finance from Surplus	0.00		
OLWR	0.00		
Cash Surplus - Working Results			0.00
Appropriation to Development Fund			0.00
Appropriation to Capital Fund			0.00
Appropriation to Debt service fund			0.00
Appropriation to Railway Safety Fund			0.00
Appropriation to RRSK			0.00
Investment from capital			81,670.53
Total:	1,24,340.50		

Composite Input Cost Index

Base 2011-12=100

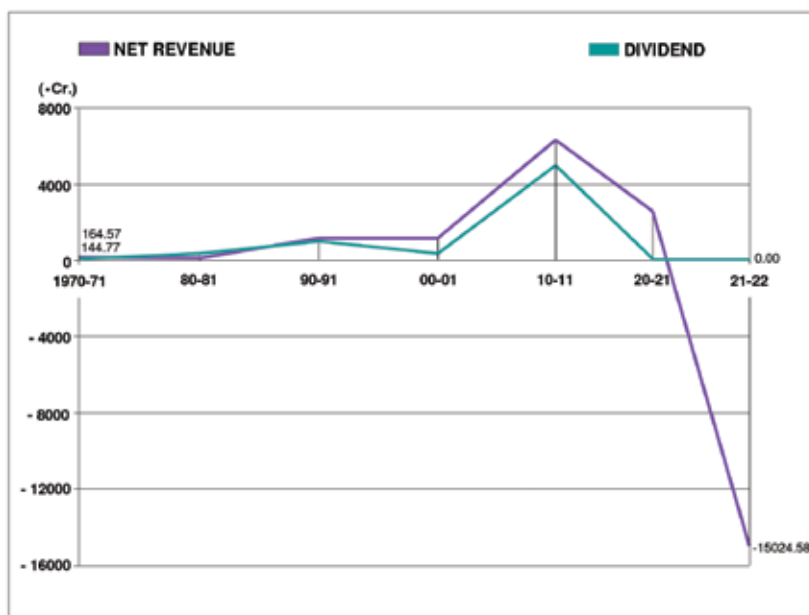
S.N.		2020-21		2021-22	
		Revenue Index	Cost Index	Revenue Index	Cost Index
I	Unit Revenue				
i	Average receipt per pkm	162.69		252.69	
ii	Average receipt per ntkm	158.05		159.50	
II	Cost Indices of Inputs				
i	Labour: Average annual wage per employee @		246.4*		274.1
ii	High Speed Diesel(H.S.D.)		80.2*		128.2
iii	Electricity (Railway traction)		109.6*		117.4
iv	Transport equipment and parts		117.8*		122.7
v	Non-Ferrous Metals		112.3*		139.7
vi	Electrical machinery, equipment & battery		113.6*		122.3
vii	Lubricants		137.2*		162.0
viii	Manufactured products		121.5*		135.0
ix	Ferrous Metals		111.4*		140.1
	Composite weighted index of inputs		189.6*		214.1

@ Based on information received from Directorate of Statistics and Economics

S.No. 2-9 based on information received from Office of Economic Adviser, Department for Promotion of Industry and Internal Trade

*Revised

NET REVENUE AND DIVIDEND



Social Service Obligation

Indian Indian Railways (IR), in the larger social and national interest, undertakes certain uneconomic operations in transportation to provide affordable transport facilities to poorer sections of society and to facilitate the movement of essential commodities meant for mass consumption. Losses incurred on this account fall under Social Service Obligation of IR.

Net Social Service Obligation borne by IR in 2021-22 is assessed at ₹49,854.33 crore excluding staff welfare cost (₹8,312.26 crore) and law and order cost (₹5,727.75 crore). These costs impinge upon the viability of Indian Railways system.

Elements of Social Service Obligation:

The main elements of Social Service Obligation in IR are losses relating to:

- Essential Commodities carried below cost;
- Concession in passenger fares;
- Losses on EMU Suburban Services;
- Operation of Uneconomic Branch & New Lines opened for Traffic during the last 15 years;
- Operation of Strategic Lines;
- Pricing of passenger fares below cost.

Concession in passenger fares:

Revenue foregone due to concession in passenger fares during the year 2021-22 amounted to ₹106.62 crore.

Losses on EMU Suburban Services :

Analysis of the profitability of EMU Suburban Services in Chennai, Kolkata, Mumbai and Secunderabad during the year 2021-22 has revealed an overall loss of ₹8,316.27 crore. Lag in the rise of passenger fares with respect to inflationary pressures prevalent in the economy has contributed to EMU Suburban losses.

Losses on transportation of Essential Commodities carried below cost:

As part of the Railway's Social Service Obligation, certain essential commodities of mass consumption like fruits and vegetables, salt, charcoal, bamboos etc. are carried below cost of operation in order to contain their

market prices. The total losses on the movement of these commodities in 2021-22 amounted to ₹1691.40 crore.

S. No.	Commodities	Losses (₹ in crore)
1	Total Food Grains	900.87
2	Salt	413.95
3	Sugar & Khandsari	155.59
4	Fruits & vegetables	92.20
5	Total edible oil	76.68
6	Charcoal	12.96
7	Cotton Raw Pressed	10.79
8	Milk and Milk Products	9.69
9	Cotton Manufactured other than Piece Goods	5.95
10	Bamboos	4.17
11	Other Wood	2.79
12	Paper	2.51
13	Wool Raw and Waste	1.73
14	Others	1.52
	Total	1,691.40

These commodities constituted 14.11% of the total revenue NTKMs and 9.25% of freight earnings in the year 2021-22.

Uneconomic Branch Lines:

Despite concerted efforts to enhance earnings on branch lines, most of such lines remain commercially unviable. The Railway Reforms committee recommended closure of 40 such lines but due to stiff public resistance and opposition of State Governments towards withdrawal of such services, only 15 lines have been closed permanently by the Railways. A review of the financial results of existing 89 uneconomic branch lines for the year 2021-22 shows that, on an original investment on these lines of the order of ₹3,923.55 crore, loss during the year 2021-22 amounted to ₹2,527.04 crore.

New lines opened for traffic during the last 15 years:

The Railway Convention Committee (RCC) in its 9th report on this subject has noted that in the present state of Railway finances and prevalent high costs of construction, the Railways are not in a position to inject adequate capital investment in under-developed areas. Therefore, they have felt that reliefs like making available land free of cost and waiver of dividend payment on such lines for a minimum period of twenty years are

justified. Periodic reviews have revealed that of the 15 lines examined in 2021-22 as part of social service obligation on the railways for development of backward areas, most lines are showing either negative or unremunerative returns.

Financial Results of New Lines for The Year 2021-22

S.No	Name of the branch line	Date of opening	Cost (₹ in crore)	Expected return on investment (%)	Actual return on investment (%)		
					2018-19	2019-20	2020-21
1	Abohar-Fazilka (BG) 34 Kms.	16.07.2012	232.50	(-)7.44	(-)16	(-)12	(-)15
2	Taran Trn-Govindwal (BG) 21.416 Kms.	06.08.2011	81.44	NA	(-)29	(-)22	(-)27
3	Ludhiana-Sahnewal (BG) 15.11 Kms.	17.11.2012	289.40	(-)2.26	(-)6	(-)4	(-)5
4	Udhampur-SVDK (BG) 25 Kms.	04.07.2014	1231.09	NA	(-)2	(-)2	(-)2
5	Banihal-Baramula (BG) 13.7 Kms.	26.06.2013	4917.00	(-)1.30	(-)3	(-)2	(-)3
6	Churaru Takrala-Amb Andaura (BG) 11.17 Kms.	2011-12	437.21	0.18	(-)11	(-)8	(-)8
7	New Morinda-Sahnewal (BG) 52.18 Kms.	2013-14	725.39	(-)2.26	(-)9	(-)8	(-)10
8	Karur-Salem (BG) 46 Kms.	25.05.2013	1117.17	NA	1.94	1.03	(-)0.37
9	Rewari-Jhajjar-Rohtak (BG) 81.257 Kms.	08.01.2013	439.36	(-)4.78	(-)2	(-)2	(-)2
10	Jind-Sonipat (BG) 81 Kms.	26.06.2016	483.10	NA	0	0	0
11	Madar-Pushkar (BG) 25.7 Kms.	23.01.2012	132.12	(-)4.06	(-)1.91	(-)1.60	(-)1.92
12	Koderma-Giridhi (BG) 86.50 Kms.	08.08.2015	699.95	NA	(-)2.13	(-)2.13	(-)2.76
13	DRU-CMGR (BG) 45.12 Kms.	17.11.2013	354.13	NA	(-)0.84	(-)0.92	(-)0.88
14	MYS-CMNR (BG) 60.78 Kms.	11.11.2008	234.52	NA	(-)0.78	(-)0.09	(-)0.64
15	Tiruvarur-Nagore (BG) 30 Kms	27.02.2009	244.75	NA	(-)0.09	(-)0.64	(-)4.58
			114.32		19.44	11.85	(-)8.26

Operation of Strategic Lines:

At present, following six operational lines only have been categorized as strategic railway lines on Indian Railways:

- (i) Pathankot-Mukerian (Northern Railway)
- (ii) RangaparaNorth Lakhimpur-Murkongselek (Northeast Frontier Railway)

- (iii) Siliguri-Jogighopa including BG conversion of Siliguri-Haldibari (Northeast Frontier Railway)
- (iv) Jaisalmer-Pokaran (North-Western Railway)
- (v) Bhatinda-Suratgarh (North-Western Railway)
- (vi) Bhuj-Naliya (Western Railway)

Apart from the above, there are other lines which are located in the border areas and serving the strategic needs of Defence and Paramilitary forces. Some of the projects have been taken up as National Projects from strategic point of view in the northeast region. Indian Railways is maintaining these services essentially for strategic reasons despite steep operating losses. The losses accruing to IR on account of operation of Strategic lines during the year 2021-22 is ₹2,249.97crore.

Pricing of passenger fares below cost:

IR being the major transport carrier of the country bears a Social Service Obligation owing to the nature of the services it is committed to offer affordable transportation solution to the poorest section of the society. This essential feature of IR contributes not only to promoting economic and industrial growth but also in providing certain services below their cost of operation in the interest of common men. Railways therefore have to fine tune between the need to maintain its financial viability and its commitments to society at large. This places certain curbs on the commercial freedom of IR in the matter of pricing and elimination of uneconomic operation and services. The resultant losses accruing to IR on account of fares below cost of operation during the year 2021-22 amounted to ₹51,138.40 crore.

The Net Social Service Obligation borne by IR in 2021-22 assessed at ₹49,854.33 crore, constitutes 26.06% of the total revenue earnings and 22.94% of the total working expenditure.

Research and Development

RDSO under Ministry of Railways is the sole R&D organisation of Indian Railways and functions as the technical advisor to Railway Board, Zonal Railways and Production Units. RDSO's major functions involve:

- Development, adoption, absorption and assimilation of new technology for use on Indian Railways.
- Development of new and improved designs of equipment and systems.
- Development and Setting standards for adoption on Indian Railways.
- Development of specifications for materials and products for Indian Railways.
- Inspection of critical and safety items of Rolling Stock (including Metro Stock), Locomotives, Signalling & Telecommunication equipment and Track components.
- Technical investigations to improve safety & reliability, statutory clearances, testing and providing consultancy services.

RDSO have collaborations with various R&D Institute such as IITs, IISc, NID, CSIR & DRDO etc. RDSO also associated with International Institutes/ Universities like UIC, Korean Railway Research Institute, BRICS Railway Research Network & Russian Railways etc., through Memorandum of Understanding in emerging technology Railway Domains. RDSO attracts worldwide attention in the area of Research & Development in Railway equipment and systems.

Some of the important activities during the year are given as:

Recognition of RDSO as 'SDO' (Standard Developing Organisation): RDSO has been recognised as SDO by BIS (Bureau of Indian Standard) w.e.f 31st May 2021, to align RDSO's Standard making procedures with the Global Best Practices & also with the Six Principles of Standardization, mandated by the Bureau (BIS) to focus on Transparency, Openness, Impartiality & Consensus, Effectiveness & Relevance, Coherence, Development Dimension. This shall mesh into the dream of Hon'ble PM for "One Nation One Standard" across the country.

RDSO is an ISO 9001:2005 certified Organisation

Online registration of Vendors (UVAM): Unified Common Vendor Approval portal (UVAM) has been developed by CRIS as a single interface for handling all the activities related with Vendor Registration for RDSO

and all PUs. It has been made functional on RDSO w.e.f 04-05-2021. Vendor registration cases are now being dealt on this portal. This portal caters to on-line payment, submission & scrutiny of documents, approval and inclusion Vendor Directory and vendor upgradation. Complete details of item specification, STR and drawings, fees and charges, trial period, upgradation quantity etc. are now available on UVAM portal.

Computerized Psychological Tests for Safety Category Staff:

Indian Railways safety category staff such as Station Master, Loco Pilot, Motorman and Station Controller, Train Operator and Customer Relation Assistant in Metro Railway, which are directly associated with the train operation have to be physically as well as psychologically fit to ensure safe train operation. After Railway Board's instruction to computerize all psychological tests, Computerized Test for Drivers of Speed Vehicles (CADAT) was developed. All the crews of the trains operating over 110 KM per hour are required to appear and pass the psychological test through this module for safe operation of high speed trains. In this computerized psychological test module, 11 new types of tests have been developed these tests are Form Perception Test, Perceptual Speed, Re-Construction Test, Picture memory, Concentration Test, Speed Perception Test-1, Speed Perception Test-2, Vision Perception, Vigilance Test, Distribution of Attention Test and Reaction Time Test. Upgraded computerized psychological test module was made functional from 1st Oct 2021.

Technological Project to improve Safety:

Development of Kavach (Train Collision Avoidance System):

RDSO has been entrusted with the task of developing an indigenous Train Control System. Kavach is an indigenously developed Automatic Train Protection (ATP) system designed to prevent such scenarios and supervise Locomotive Speed in the section by automatic application of brakes in case Loco Pilot fails to do so. The system also pre-warns the crew of the approaching signal aspect and movement authority. Three Indian vendors (M/s Medha, M/s HBL& M/s Kernex) have been cleared for developmental orders for absolute block section upto 160 KMPH speed. TCAS is a SIL-4 certified system which can be interfaced with existing interlocking

Important features of Kavach (TCAS):

- Prevention of Signal Passing At Danger (SPAD)
- Continuous update of Movement Authority
- Prevention of Over speed: Section Speed, Train Speed, Permanent Speed Restriction and Loop Line Speed Control
- Prevention of collision between two Locos equipped with functional Kavach (TCAS)
- Automatic whistling at Level Crossing Gates
- Centralized live monitoring of Train movements

New Design of Flameless Pantry Car: In compliance to Catering Policy-2018 regarding switchover of LPG cooking system to flameless cooking in Pantry cars, one prototype ICF BG Self Generating Non AC Pantry Car coach (WGCB) has been converted to flameless cooking system at AMV/NR with improved design and new transportation code, WGCBF. Speed certificate issued up to a max. operational speed of upto 110 kmph on IR. The Electrical Scheme, Layout design and prompt sanction has been carried out by RDSO.

Development of Broken Rail Detection System (BRDS): Broken Rail Detection System (BRDS) will determine the brake of Rails. Trial of following two technologies of Broken Rail Detection systems is in progress on IR.

- i. Ultrasonic Based Broken Rail Detection System which includes Guided Ultrasonic Wave Signals & Transmitter Receiver Confirmation Protocol.
- ii. OFC based Broken Rail Detection System in which OFC cable laid parallel to the railway track and Acoustic signature generated by passing train is compared with a Library and alarm is generated.

Technological Projects to improve Passenger Amenities & Comfort:

Train set (Train-18 Vande Bharat):

RDSO has issued the specification for procurement of IGBT Based 3-Phase Propulsion, Control and other equipment for Train Sets for Vande Bharat express. Performance testing is being planned alongside oscillation trials for early rollout. Railway Board has placed for procurement of 44 Rakes (16 Cars each) for which the design documents, acceptance testing of equipment and components, Oscillation trials and performance testing has been entrusted to RDSO.

The special features are as follows:

- Developed under Make-in-India initiative of Government of India Stainless Steel Car Body
- LHB Design as base design
- 16 Coach Chair Car Type configuration
- 160 kmph speed
- Faster acceleration
- Automatic Doors & Footsteps
- GPS based PIS/PAS
- Fire Detection System
- CCTV System for surveillance

Development of AC-3 tier Economy (LWACCNE) Coach: RDSO designed new ergonomic layout for AC-3 tier LHB coaches utilizing floor space by shifting equipment to under frame to increase the Passenger capacity from 72 to 83 berths. Besides superior interior furnishing, (PA/PIS), CCTV, smoke/fire detection system, LED Lights, 920mm wider entrance doors the design has a 160 KN air-spring suspension for better riding comfort. The Final Speed Certificate of LWACCNE coach was issued on 05.03.21 & the coach has proved extremely popular with the travelling public.

Comprehensive solution to jerks in LHB coaches:

RDSO has carried out detail study of longitudinal force transmission mechanism through CBC. 24 trials were conducted on passenger trains during the period 20-10-21 to 17-12-21 for jerk measurements in LHB coaches as well as baseline values in ICF coaches using portable DAQ equipment, without any disruption to run special trial trains. These trials have covered jerk events under different operating conditions of IR, as well as with CBC couplers at various stages of wear. Detailed trials with a newly developed taper profile knuckle were also carried out. RDSO developed the software to determine physiological jerk perception results from the trials that closely match passengers' perception. Main design improvements were identified in articulation, draft gear preload and with taper profile knuckle. Detailed design of radial articulation, spherical articulation and taper knuckle profile were developed, got manufactured and type tested. The investigation report and recommendations have been submitted to Railway Board for consideration.

Infrastructure

LTE Tower Design for 'Kavach': Indian Railways has planned to install KAVACH (Indigenously developed automated train protection system), a UHF and LTE (Long Term Evolution) based Mobile Train Radio Communication over its entire network. This is a project of national importance and will help attain world class efficiency, safety and security on Indian Railway network. The above technology requires communication towers to be installed along the track at regular intervals. RDSO has recently completed design & drawings of twelve combinations of height, type of towers (Lattice type and Monopole type) and foundations to cover most of the site situations and their Design Basis Reports.

Dedicated Test Track: A dedicated test track for carrying out oscillation trials as per international methodology of rolling stock certifications (UIC-518/EN-14363), accelerated testing of rolling stock/ Permanent Way/S&T/ OHE components and various other types of special studies is under construction along abandoned MG alignment between Gudha Salt and Tathana Mithry station of Jodhpur division of NW Rly. This work is being executed by CAO/Con./NWR under technical guidance of RDSO. Design

of Test Track has been finalized in house by RDSO. The total length of dedicated test track is 58.52 Kms.

The advantages of test track are as follows:

- Testing for higher speeds upto 200 kmph.
- CRS sanction for trials not required.
- Reduced testing time: 8-12 days (Approx.) v/s. 20-30 days.
- Accelerated testing facility for rolling stock and infrastructure components.
- Faster introduction of new designs of rolling stocks and other infrastructure items (saving of 8 to 24 months). (Speed Certificate, CRS Sanction, GM Sanction etc. not needed).
- Line capacity and earning potential of Mainline track not compromised (approximately 40 paths over 125 to 150Km).

Bow String Girder Type ROB designs for catering to six lane highways: Bow String Girder Type designs for catering to six lane highways have been developed for four spans i.e. 72m, 60m, 56m, 48m in association with NHAI. Now RDSO has standardised total 21 nos. of Bow String type girders. Stainless Steel ROB (composite girder type) for spans 30m & 36m for deck width of 12.3m, 15.3m & 15.6m have also been developed for Central Railway and Western Railway being corrosion prone areas.

Operational efficiency:

Development of WAP-7HS Locomotive: RDSO has upgraded WAP 7HS to 160 kmph by changing the gear ratio from 3:6 to 3:18. It has Better Line Capacity utilization & used for high speed passenger train operation. There is Weight reduction by 14.5 T.

Development of WAG-9HH Locomotive: RDSO has developed 9000 HP Locomotive fit to run @ 100 Kmph under Make-in-India initiative of Government of India. The newly designed Locomotive has better acceleration reserve at higher speed and ensures adequate powering of freight trains leading to better line capacity utilization. It is being used for freight train operation over IR and DFC.

Development of Newly Modified High Speed Automobile Carrier (NMGHS): An automobile carrier coach for carrying automobiles, 2-wheelers and parcels at 110 kmph from ICF Coaches being released from services has been designed by RDSO. These old coaches can be converted at low cost with provision for End loading and Side loading from Platforms and shall have speed potential of 110 kmph. This shall address the crying need of automobile industry for safe and cost effective carriage of automobiles across the country.

Indigenous development:

Development of Fibre Bragg grating (FBG) based Wild system:

RDSO has developed Fibre Bragg Grating (FBG) based WILD system in close cooperation with Indian Institute of Science (IISc) and an associated startup (M/s Lab to Market). Major activities like System design, Lab prototyping and installation of prototypes has been carried out at LC-15 & LC-130 of Bangalore Division and started functioning. In line with the efforts being made by Indian Railway for switching over to predictive maintenance regime based on real time condition monitoring of the asset health using different types of sensor. Joint patent has been filed by RDSO, IISc Bangalore and Lab to Market for commercialization of system is under finalization.

Development of Specification for Hydrogen Fuel Cell based 1200 kW DEMU:

RDSO has prepared technical specification for 'Development of Hydrogen Fuel cell based DPRS 1200 kW DEMU'. This is a new technology and initially retro fitment of 1200 kW DEMU operating between Sonapat - Jind sections of Northern Railways with hydrogen fuel cell based system has been considered for this project. Hydrogen is high energy fuel (120 MJ/Kg) in comparison to diesel (43 MJ/Kg) with low maintenance and manageable Carbon footprint. In the proposed hybrid power system, the primary energy source is Proton Exchange Membrane Fuel Cell (PEMFC) and secondary energy source will be battery bank to meet the peak and average power requirement. LOA issued to M/s MEDHA with completion time of 30 months.

Development of Broad Gauge Flat pneumatic steel V – Groove (BFNV) Wagon:

RDSO has developed design of Broad Gauge Flat wagon with V - Groove (BFNV). The wagon permits loading from sides which is advantageous for quick loading in OHE territory, and suitable to transport of CR/HR coils upto 1900mm along with specially designed locking arm.

Design of 2x25 KV AC OHE/PSI system for 160 kmph speed:

In order to enhance speed upto 160 kmph for Mumbai-Delhi and Kolkata-Delhi Rajdhani routes guidelines issued for checking of suitability of existing OHE structures for upgradation of 25 kV AC OHE. Specifications for all the major equipments required for 2X25 kV AC OHE issued .The vendor development of 15 no. PSI items for 2x25 kV system was identified. The vendor for 12 items has been developed and remaining 3 items (whose specification was revised) are under design Drawing/ prototype testing stage.OHE work to increase tension from 1000 kgf to 1200 kgf is in progress by Zonal Railways. PSI guidelines issued and 59 nos. drawings issued for TSS SP SSP connectors and cable trench.

Consultancy:

Amendment proposed in IRSOD (BG) ACS 21 for High Rise OHE: RDSO has reviewed the requirement for High Rise OHE and also

proposed to reduce the Contact wire height from 7570 mm to 7270 mm. Apart from above, dimension for all major infrastructure enroute like ROB/ FOB etc also reviewed and RDSO has submitted proposal to Railway Board on 13.09.2021 to reduce ROB/FOB height to 7870 mm/8250 mm in place of 8050 mm/ 8430 mm. The proposed amendment shall help in reducing height of new ROB's & FOB's resulting in substantial saving in construction. It will also result in better current collection as well as ease maintenance.

Tests & Trials

Testing of Rolling Stocks during 2021-22:

Speed trials & speed certificates issued for Rolling stock: RDSO has conducted record speed trials and issued speed certificates for introduction of various types of rolling stock during last financial year details as under.

Metros: Oscillation Trials, Emergency Break Distance (EBD) and static test for Kanpur, Pune and Gujarat Metro have been conducted.

Coaches: Oscillation Trails for LHB Coach with 160kN Air spring, ICF Automobile Carrier Coach (NMGHS), Double Decker Chair car, 12 car AC EMU rake have been conducted.

Wagons: Oscillation Trails for Triple Stack Container, BOXNM1 (DFCCIL), BCNHL, BCNM1, BCNAM and Wagons for steel Coil (BFNV) have been conducted.

Locos and Track Machines: Oscillation Trials for Track Machines-CDC-16W, BRM SPRSPZ, 9000 HP Loco of BHEL and Commissioning Trial of IWS for WAG9H have been conducted.

Implementation of UIC-518/ EN 14363:2016: Indian Railways currently uses the criteria developed over years of experience for assessment of the safety and comfort levels of Rolling Stock before clearing for regular operations over IR. More advanced Railways such as those in Europe adopt more statistical assessment based approach in some form or other that look at the predominant behavior of the vehicle under dynamic conditions. For evaluation of rolling stock at higher speeds, a project has been taken up for implementation of international standard UIC-518/EN-14363. This shall help in establishing Indian developed Rolling Stock for International markets too. IR shall switch over to EN 14363 standards by June 2022.

Track Recording: To ensure safety of traffic periodic track monitoring of Indian Railways track is done by TMM Directorates. Testing directorate of RDSO also involves in various types of trials viz. Oscillation Trials, Coupler Force, Controllability, EBD, R&P and Jerk trials, COCR trials, TM Runs, Squeeze Test, Special Trials & study.

During the financial year track recording of 1,45,668 Km have been completed by TMM Directorate of RDSO.

Undertakings and other Organizations

As many as 14 Public Sector Undertakings and other Organizations are functioning under the Ministry of Railways, as detailed below:-

S. No.	Name	Year of Incorporation/ Inception	Core competence
1	BITES	1974	To design, establish, provide, operate, maintain and perform engineering, technical and consultancy services for development of projects/systems of all types and descriptions pertaining to Railways and Other Sectors/Industries in India and outside India.
2	IRCON	1976	To undertake construction activities in India and abroad on turnkey basis or otherwise in various fields of infrastructure like Railways, Bridges, Roads, Highways, Industrial and Residential Complexes, Airports, etc.
3	CRIS	1986	CRIS is the IT arm of Indian Railways. It designs, develops, implements and maintains centralized IT system for all departments of Indian Railways.
4	IRFC	1986	To raise funds from the market to part finance the Plan Outlay of IR.
5	CONCOR	1988	To develop multi-modal logistics support for India's international and domestic containerized cargo and trade.
6	KRCL	1990	To construct and operate railway lines, construct Road Over Bridges and rail line projects.
7	RCIL (RailTel)	2000	To utilize the surplus telecom capacity and right of way available with the IR to build nationwide optical fibre cable based broadband telecom and multimedia network.
8	IRCTC	2001	To undertake catering and tourism activities of the Railways. Also facilitates internet ticketing through its website.
9	PRCL	2001	To execute the Surendranagar-Rajula-Pipavav Port gauge conversion and new line projects in Gujarat.
10	RVNL	2003	To create and augment the capacity of rail infrastructure. To mobilize resources mainly through multilateral/bilateral funding agencies and also through domestic market for successful implementation of projects.
11	RLDA	2005	To develop vacant railway land for commercial use for the purpose of generating revenue by non-tariff measures for IR.
12	DFCCIL	2006	To plan and construct Dedicated Rail Freight Corridors (DFCs) for movement of freight trains on the corridors.
13	MRVC	1999	To plan and implement rail projects in the Mumbai Metropolitan Region.
14	BCL	1976 (In MOR from 2010)	To manufacture wagons, undertake structural fabrication jobs and manufacturing, retrofitting of EOT crane.

Rail India Technical and Economic Services Limited (RITES)

The journey of RITES Limited, a Miniratna (Category-I) and Schedule 'A' Central Public Sector Enterprise under the Ministry of Railways, symbolizes India's nation-building process. From the time the company was incorporated in 1974, to the time it became a public listed entity in 2018, and beyond, RITES has completed numerous mega and complex infrastructure projects and has evolved into a multidisciplinary consultancy organization.

RITES offers a comprehensive array of services from concept to commissioning in all facets of transport infrastructure and related technologies. It is uniquely placed in terms of geographical reach and consultancy services in sectors such as railways, highways, airports, ports, ropeways, institutional buildings, urban engineering (metros) & sustainability, inland waterways, and renewable energy. During this eventful journey of over 48 years, RITES has successfully served clients in more than 55 countries across Asia, Africa, Latin America, South America, and Middle East regions.

The organization's objectives are five-fold:

- **Diversification:** Innovating and Adapting new technologies & methodologies.
- **Sustainability:** The touchstone of every activity.
- **Be a Master Systems Integrator:** Concept to Commissioning.
- **Economic Services:** Leveraging the 'E' in RITES.
- **Partnerships:** Fostering cooperation and collaboration.

With a diversified business model revolving around key verticals such as consultancy, leasing, exports, turnkey and sustainability, including power management, RITES continues to follow a path of systematic and professional operations. Also, in several countries where RITES pursues business interests, there is an increased thrust on the expansion and upgrade of infrastructure, including rail and road network, Light Rail System (Metro) and multi-modal transport network, resulting in faster, safer and timely movement of goods and passengers. With immaculate teamwork, RITES successfully provides opportunities for technical consultancy and export of rolling stock (indigenously developed and customized offerings) to these countries.

The year round-up

During the financial year 2021-22, the company's performance reached the pre-covid levels. It recorded consolidated revenue of ₹2,745 crore and achieved highest-ever export revenue, including services, of ₹1,070 crore. Profit after tax for the year stood at ₹538 crore.

Select projects (executed & secured)

- Supply of 150 main line passenger coaches and 2 sets of air-conditioned DEMUs comprising 26 coaches to Sri Lanka.

- Supply of 3 cape gauge diesel electric locomotives, 24 coaches and 1 DEMU to CFM, Mozambique.
- Establishment and maintenance of CORS network for Mumbai-Ahmedabad High-Speed Rail Project.
- Final Alignment Design, including aerial LiDAR survey, and other related works for Delhi-Ahmedabad High-Speed Rail Corridor.
- Construction supervision of dual gauge railway line from Bogura to Shahid M. Mansur, Bangladesh Railways.
- Railway electrification works for Mysore-Hassan-Mangalore and Lumding-Badarpur lines.
- Feasibility Study for Regional Rail Transit System (RRTS) in and around Ahmedabad.
- Project Management Consultancy-cum-External Technical Auditor for greenfield Purvanchal Expressway.
- Project Management Consultancy for construction of grade separators at NAD junction in Visakhapatnam.
- Feasibility study for new standard gauge railway line in Gabon for the Government of Gabon.
- Project Management Consultancy for Banka ropeway in Bihar.
- Engineering study for road network and detailed design of link road and helipad at Indorama Eleme complex, Nigeria.
- Feasibility study for extension of Mauritius Metro Express.
- Consultancy, preliminary design services for Bahrain Metro extension to Bahrain Sport city.

Awards & Recognition

RITES has received several awards and accolades during the last fiscal year. Some of these are:

- EEPC Award for Top Exporter (2017-18) under the Merchant Exporter category
- IEI Industry Excellence Award 2021 under the Engineering Services & Consultancy category by the Institute of Engineering
- Technology Award by Japan Society of Civil Engineers for being General Consultant for Delhi Metro-Phase III
- Project of the Year (Small Category) PMI South Asia Awards 2021 for construction of store depot, scrap yard & allied works at Sabarmati
- ICAI Award, Plaque for Commended Annual Report, for excellence in financial reporting 2020-21

- Dun & Bradstreet Corporate Award 2021 for 'Best Growth Performance' in the Engineering Projects/Capital Good category
- 8th Governance Now PSU Award for 'Resilient Growth' in the financial category

Going Forward

RITES has achieved operating revenue (standalone) of ₹578 crore in Q1 of FY 2022-23 (April-September, 2022), as compared to ₹333 in Q1 of FY 2021-22.

Ircon International Limited (IRCON)

Ircon International Limited (IRCON), a Schedule "A" & Miniratna – Category I Central Public Sector Undertaking (CPSU), incorporated by the Ministry of Railways under the Companies Act, 1956 on 28th April, 1976 originally under the name "Indian Railway Construction Company Limited". It was created for the development of railway networks in India and abroad utilizing the expertise of Indian Railways.

Over the years, while keeping railway projects as its focus area, it diversified into a wider spectrum of infrastructure such as Highways & Expressways, Tunneling, Bridges, Metro, Power substation, transmission & distribution, Buildings (Industrial, Commercial & Residential), Townships, and Airport Runways & hangars and Mass rapid transit system.

The company has extended its operations to other countries like Algeria, Bangladesh, Iran, Iraq, Malaysia, Nepal, South Africa, Sri Lanka, Bhutan, Myanmar, Afghanistan, Syria, Turkey, Ethiopia, Tanzania, Mozambique, Zambia, Liberia, Nigeria, Indonesia, etc.

IRCON operates not only in highly competitive environments but also in difficult terrains & regions in India & abroad and is an active participant in prestigious nation building projects.

A relentless contributor in India's growth story, the company has successfully executed more than 398 landmark projects in India & 128 projects abroad in more than 25 countries.

IRCON has been an active participant in prestigious nation building projects. It contributed in bringing the Kashmir valley on the map of Indian Railways by construction of 340 KM New Rail link from Qazigund to Baramulla, the Biggest Broad Gauge Railway Line Construction ever undertaken in the high mountainous region in India. Facing Militancy at its peak in J&K in 2011, IRCON constructed the longest Railway Transportation tunnel of 11 Km through the Pir Panjal Range.

Out of the three (3) Rail Coach Factories of Indian Railways, two (2) coach factories have been established by IRCON.

In 2016, with Rail Cum Road Bridge on River Ganga at Patna, the company successfully commissioned one of the largest double decker steel bridge of 4.56 Km length.

Presently IRCON is engaged in the construction of 45 Kms long Sivok Rangpo railway project, running through West Bengal & Sikkim providing first Rail link to Sikkim with rest of the country. The project will enhance the socio economic development of the region, give boost to tourism in Sikkim and provide strategically important connectivity for movement of our defence forces.

Currently, IRCON have ISO 9001:2015 certification for Quality Management System and validly of the same is up to March, 2023, ISO: 45001-2018 certification for Occupational Health & Safety Management System and validly of the same is up to December, 2024 & ISO 14001:2015 certification for Environmental Management System and validly of the same is up to February, 2023 for its operations.

Achievements of IRCON in the year 2021-22

- In the year 2021-22, IRCON has secured new domestic works of approx. ₹14,400 crore through competitive bidding and one foreign project for Construction of Road from Paletwa (Myanmar) to Zorinpuri (Mizoram) under Kaladan Multi Modal Transit Transport Project (KMMTTP) on EPC Mode in Myanmar valuing ₹1,780 crore.
- In FY 2021-22, IRCON has secured several projects in India worth ₹14,400.71 crore through competitive bidding. Some of them are as follows.
 - Railway Electrification works for Badarpur- Jiribam, Katakhal - Bhairabi and Badarpur- Karimgang - Sabroom Incl Karimgang - Maishasan, Agartala - Akaura and Baraigram - Dullabachera (NRF)- ₹658.64 crore.
 - Design and Construction of Civil and Building Works including Testing and Commissioning on Design Build Lump Sum Price Basis for Double Line High Speed Railway in the State of Gujarat for the Project of Construcion of Mumbai- Ahmedabad High Speed Rail (Package No. MAHSR C-7)- ₹1,714.23 crore.
 - Design, Supply and Construction of Track and Track related works including Testing and Commissioning on Design-Build Lump Sum Price basis for Double Line High Speed Railway between Zaroli Village at Maharashtra-Gujarat Border and Vadodara in the State of Gujarat and the Union Territory of Dadra and Nagar Haveli for the Project for Construction of Mumbai-Ahmedabad High Speed Rail. (Package No. MAHSR T-2)- ₹5,143 crore.
 - Upgradation and Four Laning of Haridwar Bypass Package-1 for National Highways Authority of India in the state of Uttarakhand on Hybrid Annuity Mode - ₹861 crore.
 - Construction of Eight Lane Access Controlled Expressway (Bhuj to Morbe Section-SPUR of Vadodara Mumbai Expressway) for National Highways Authority of India in the State of Maharashtra on Hybrid

Annuity mode under Bharatmala Pariyojana (Phase-II- Package-XVII)- ₹1,436 crore.

- Construction of Four/ Six lane Greenfield Ludhiana- Rupnagar National Highway no. NH-205K from junction with NE-5 village near Manewal (Ludhiana) to junction with NH-205 near Bheora Village (Rupnagar) including spur to Kharar with Ludhiana Bypass under Bharatmala Pariyojana for National Highways Authority of India in the State of Punjab on Hybrid Annuity Mode: Package-3 (total length 43.26 km)- ₹1,107 crore.
- Construction of Eight Lane access-controlled Expressway from Km 3.000 to Km 20.200 (Shirsad to Akloli Section-SPUR of Vadodara Mumbai Expressway) for National Highways Authority of India in the state of Maharashtra on Hybrid Annuity Mode under Bharatmala Pariyojana (Phase II-Package XIV) - ₹1,124 crore.
- Setting up of 500 MW Grid Connected Solar PV Power Projects in India (Tranche III) under Central Public Sector Undertaking (CPSU) Scheme Phase-II (Government Producer Scheme)- ₹1960.04 crore.
- Composite works (Civil, Electrical and Mechanical) involving construction of Industrial shops with Pre-Engineered Building (PEB), Extension of RCC Box bridge and other ancillary buildings, water supply system, drainage system, track works, road works, electrification and illumination works, associated works, associated telecom works and supplying & commissioning of specified Mechanical Machineries (EOT cranes etc.) in connection with Detachment free rake examination facilities at Exchange Yard of Bondamunda, South Eastern Railway- ₹48.06 crore.
- In the year 2021-22, IRCON has successfully completed the following projects:
- Visakhapatnam (Diesel Loco Shed) Augmentation of shed for homing 100 HHP locomotives at a value of ₹101.60 crore
- DPR & Detailed Engineering Project Management and Construction of Coal Transportation System for Nabinagar Super Thermal Power Project (3x660 MW) at a value of ₹15.36 crore.
- In June 2021, IRCON completed the work of dismantling and reconstruction of Valsad Road over Bridge after inserting twin-precast box of 16m x 10m size in record 20 days time for taking the NTC machine through it, making new methods of construction possible.
- SAP latest version S4HANA is under Implementation in IRCON to improve the overall performance and efficiency of the company.

Achievements in ongoing major projects of IRCON during FY 2021-22

- IRCON has recorded remarkable achievements in its ongoing major projects such as Udhampur-Srinagar-Baramulla Rail Link (USBRL) project, Sivok-Rangpo Rail Link project, Hajipur-Bachwara Doubling project, Corridor-I of East Corridor between Kharsia to Dharamjaygarh project, Katni-Singrauli doubling project and Dedicated Freight Corridor Project, CTP-12.
- After the end of the year, on May 30, 2022, an international standard fully air-conditioned multi-purpose Indoor Stadium, at Behala, with state-of-the-art facilities, which was constructed by IRCON was inaugurated.

• ACCOLADES

Ranked in Top 250 International Contractors and Top 250 Global Contractors by Engineering News Record (ENR), USA. Also ranked amongst the Top 500 Indian Companies in Fortune India Magazine.

- Healthy profitability margins & comfortable liquidity position with its CARE Credit Rating of AAA/A1+ for long & short-term non-fund based borrowings. Continuously profit making company since its inception.
- Conferred with several awards in the Year 2021-22 including Governance Now 8th PSU Award in CSR Commitment category, National Awards for Excellence in PSU (Category: Innovation Social Media Outreach), National Awards for Excellence in PSU (Category: Increasing the Geo-Strategic Reach) and Greentech Foundation Safety Award for Construction Safety.

FINANCIAL PERFORMANCE

In the year 2021-22, the Company has registered total income of ₹7,181 Crore. The Profit before tax achieved by the company is ₹610 Crore and the Profit after Tax achieved is ₹544 Crore. The Net Worth of the company is ₹4,621 Crore.

Centre for Railway Information Systems (CRIS)

The Centre for Railway Information Systems (CRIS) is an Autonomous Organization of the Ministry of Railways, with its headquarters in New Delhi and Regional Offices in Delhi, Kolkata, Mumbai, Secunderabad and Chennai. It develops and manages the IT systems of the Indian Railways, with terminals and counters spread across the country from Kargil to Kanyakumari, and from Tawang to Port Blair. Together with a team of IT professionals with rich practical experience, CRIS has successfully positioned itself at the vanguard of Indian Railways' digital transformation.

CRIS is developing and managing IT applications in all areas of Railway

working, and has been focusing on interfacing these applications to provide a unified IT platform for Indian Railways. The activities & developments during the financial year 2021-22 done by CRIS, are given below-

1. Ticketing and Passenger Services

Passenger Reservation System (PRS) - For COVID-19 Special Trains, new business rules were implemented for Train Management, fare, ticketing & refunds, Concessions, Destination address capturing, Booking restriction etc. QR Code was integrated into web-ticketing, mobile ticketing as well as counter ticketing, in which QR code of the URL was sent as an SMS to all system tickets booked. It was integrated with E-Pass System for Privilege Pass and PTO. Booking was allowed against E-RRB pass for RRB candidates. Ticketing facility was provided to youths for participating in “Ek Bharat Shreshtha Bharat”. The NGeT Website and mobile apps were launched with new features to enhance user experience. New versions of the Android and iOS Mobile Apps of IRCTC Rail were released to take care of changing user needs and changes in rules and policies.

Modernization of Concert Phase 1&2 - The process of auto-chart preparation after train cancellation was further streamlined to ensure convenient refund of tickets booked through IRCTC. The old data warehouse website (<https://dw.indianrail.gov.in/>) was migrated to PRIMES application (<https://primes.indianrail.gov.in/PRIMES>).

Unreserved Ticketing System (UTS / UTS on Mobile) - Integration was done with NTES to show available trains in ATVM application. Nearly 100% implementation of coaching balance sheet was achieved across IR. UTS Mobile App was launched in Hindi. Developed web services and rollout for on boarding UTS services on UMANG platform for Enquiry of UTS ticket fare and availability of ATVMs at various locations. UTS mobile app was integrated with Maharashtra state government-issued Universal Pass over Mumbai suburban section. The App validated and allowed ticket booking for fully Covid vaccinated passengers. A new option NEXT TRAINS was released in UTS Mobile app (Android, iOS) after Journey or QR Booking. Changes to enable/disable ticketing on route parameter basis was also released in UTS Mobile app to give full control and flexibility for Railways to enable or disable ticketing based on the routes, ticket, train and class as per their local requirements.

National Train Enquiry System (NTES) - During the national Lockdown for COVID pandemic, dissemination of relevant information to the public through NTES was facilitated for running of Special Trains like Parcel Specials, Shramik Specials, Mail/Express and Passenger Specials. NTES application was enabled to receive Zero-based Timetable data from SATSaNG accurate to seconds, and use it for all its functionalities. NTES was integrated with Integrated Passenger Information System (IPIS) for disseminating of Train Running Information and Train Coach Position for Passenger trains at the stations. Enabled NTES Apps for monetization by provisioning these interfaces to display advertisements.

Hand-held terminals for TTEs (HHT) - Configuration for download of chart automatically; optimization of security and synchronization to eliminate the lag in chart loading; and consolidated working report of TTEs on-board were implemented. Integration of HHT Application with POS machines was done.

Computerization of TTE Lobbies at Interchange / major stations (CTTL) - Train profiles of all special trains running during lockdown were updated; enhancement for assignment of duty (with or without roster) to TTEs were done. EFT (Excess Fare Ticket) module was linked with duty of all individual TTEs at the time of Sign On/Off.

Parcel Management System (PMS) - The provision for generating e-PWB/e-LT in PMS application was made online. Joint Parcel Project of Indian Railway and India Post was launched on 31/03/2022 from Surat. 114 Parcel Offices were made functional under CPMS Ph 2; work was in progress at 25 Parcel Offices as on 31/03/2022.

RailMadad - www.railmadad.indianrailways.gov.in - MIS Reports infra and application infrastructure were made separate for better results.

2. Freight Operations, and Safety

Freight Operations Information System (FOIS) – 1,130 Warehouse, 1,904 Labour, 2,231 Transporter, 908 Aggregator Service Providers were registered in the Freight e-Marketplace. E-Payment facility was made available to about 1400 customers. As on 31/03/2022, around 84% of the total freight payment was through e-payment. Support to field users was provided along with design, development and implementation of new features and enhancements in the system to meet business requirements.

Integrated Coaching Management System (ICMS) - Bulk cancellation of coaching trains; running of special trains like Parcel Specials, Shramik Specials, Mail/Express and Passenger Specials; integration with several other applications like SFOORTI (FOIS), CMM, PRS, UTS, COA, PMS, TTE Lobby, Rail Sugam; tracking of Isolation marked coaches for housing of potential Covid patients were implemented.

Crew Management System (CMS) - GPS coordinates of lobby locations were updated and around 40% Sign on/off were being done through Chalak Dal Mobile App. The Chalak Dal mobile app was also developed on IOS platform. All the 448 lobbies/locations of CMS final phase were commissioned (CMS phase-1 of 296 locations had already been completed).

Control Office Application (COA) - About 5.20 lakh Arrival/ Departure/ Run Through events are now being updated daily by all Divisions in the Control Office Application. The daily Arrival/ Departure/ Run through updates from RTIS/ REMMLOT are about 88,000. Total 128 integrations had been implemented through the Enterprise Service Bus (ESB). Business Continuity Plan for Enterprise Service Bus was tested successfully on 22/03/2022.

Real-Time Train Information System (RTIS) - 2700 RTIS loco devices have been installed in electric locomotives. Train movement data using GPS from about 6500 loco devices (3800 REMMLLOT devices & 2700 RTIS devices) is being forwarded to COA using RTIS central server. Tender for RTIS Phase-2 roll-out to cover 6000 more electric locomotives was finalized and PO issued to the vendor.

Safety Information Management System (SIMS) - SIMS application was integrated with eDrishti application for consequential accidents, derailments and SPAD cases.

Software Aided Train Scheduling System (Satsang) - During National Lockdown owing to the Covid Pandemic, Satsang facilitated running of Special Trains {3000 Mail Special Covid (MSPC)/Passenger Special Covid(PSPC), 2700 Parcel and 7000 Shramik trains}. Zero Based Time Tabling (ZBTT), using scientifically calculated Bare Run Times (BRT), instant comparison of pre-ZBTT and post-ZBTT statistics, migration of 3000 profiles (MSPC/PSPC) to ZBTT, creating different time components of time table in seconds, and integrating time table with other applications were implemented.

3. Rolling Stock Management

Loco Maintenance & Operational Management System (SLAM) - Integration of SLAM with IREPS for non-stock items, and with FOIS for Loco Shed-in, Loco Shed-out and Loco Schedule updation, was successfully achieved. Network survey and identification of location of terminal support system (TSS) was completed for all Electric Loco sheds, Trip sheds, TLCs, POH shops, RDSO and CLW.

Workshop Management Information System Phase 2 (WSC2) - WISE application was integrated with IMMS, IPAS, CMM, and FMM applications. 90 days failure reporting for Wagons and 100 days failure reporting for Coaches was developed.

Maintenance Module for Coaching Depots Phase 1 (CMM) - Complete integration of coach master between ICMS, WISE, and MDMS was commenced. Number unification of coaches was started during POH and integration with MDMS to update coach type details using ESB were done. Coach Schedule forecasting had been implemented using Drools rule engine. This forecasts due schedules and due dates for both LHB and ICF coaches, for both Mechanical and Electrical Dept.

Freight Maintenance Management Module (FMM) - Integration of UDM (User Depot Module) of material management was done. A total of 11,153 nos. of BPCs were generated by 147 freight yards across IR during March, 2022, which is the highest ever number of BPCs created. Training was imparted to the Railway users on FOIS-FMM integration.

Automated rolling stock track & trace system using Radio Frequency Identification (RFID) - Tagging was completed in over 1,00,000 wagons and 5,800 coaches.

Enterprise-wide System for BLW, Varanasi - Integration with MMIS (Current stock) was completed.

Modern Coach Factory, Rae Bareilly - Integration with MMIS (Current stock) & CMM (for receiving of coach no); digitization of drawing through PLM software was completed.

Rolling Stock Sanctions Management System (ROSMAS)- Created the new web application called the Rolling Stock Sanctions Management System (ROSMAS) or Gati Pravah, for automating the process of issue of speed certificates by RDSO.

4. Fixed Assets Management

Track Management System (ITMS) - “USFD Rail Testing Due/Overdue” (Ultrasonic Flaw Detection) module was modified (as per USFD CS-6) for implementing “Test Free Period (40 GMT/8 Years)” and removing “Reduced Frequency” based calculation. “USFD Testing” module was enhanced to allow 15 days advance testing in case of AT welds due for 1st periodic testing. Gati-Shakti module was enhanced for clearance study of double stack containers having dimension 2600 x 1930 mm. RGM module was enhanced as per suggestions received from RDSO.

Traction Distribution Management System (TDMS) - Foot patrol mobile app was enhanced and implemented for pan-Indian Railways. Dashboard module of Tower Wagon for Tower Wagon Running, fuel consumption, Issues, POH Overdue, Codal Life, Ultrasonic Testing Overdue and TXR pending along with Tower wagon summary was developed.

Bridge Management System (IBMS) - Web Service integration was done for sharing BMS data with GIS & e-Drishti. New functionality was developed for auto-compliance of previously generated bridge defects, once new inspection had been entered. 14 WLMI (Water Level Monitoring) devices have been integrated with BMS application for continuous automatic water level monitoring.

Web based Indian Railways Projects Sanctions & Management Phase 1 & 2 (IRPSM) - The Umbrella Works module and monthly progress monitoring module were enhanced and various other forms and reports were developed. Integration with e-Tendering portal (IREPS) and e-Bill payment portal (IPAS/ AIMS) was done successfully.

CRS Sanction Management System (ICRS) - Modules for CRS sanction of “Opening of New Line” and “Electrification of Line” were developed.

Land Management Information System on IR (RLMS) - Provision for online payments through MERS portal was provided in the respective Modules.

Provision for auto-generation of Wayleave charges and Detailed Estimate was provided for uniformity in preparation of estimate for all division of IR.

GIS Map & Geospatial Database for Indian Railway Assets (GISP) - RDPS (Route Data Planning System) data from 68 divisions i.e. total 98.58% of route length (excluding sections under Gauge Conversion) was published. Gaps (i.e. 6,628 Km gaps) for Land Plan geo-referencing were identified and communicated to concerned Divisions. Digitization of track of 9 divisions was completed. A dashboard was developed for track & bridge analysis.

5. Finance and Human Resources

Integrated Payroll and Accounting System over Indian Railways (IPAS) - Provision was made in IPAS for passing offline GeM purchase contracts along with all proposed validations as suggested by Rly Board. Necessary integration was done with FOIS and ICMS application to fetch IRFA debit/credit data for transfer between railways along with automation utility for IRFA charges calculations, to raise suitable auto TC's and JV's for IR and MIS reports under e-Recon module of IPAS. Modifications done in IPAS in consultation with SBI to top up RuPay Imprest card through CIPS.

Goods & Services Tax Module (GSTM) – The application enabled minimal rejections by GSTN and timely filing of monthly (GSTR-1 & GSTR-3B) & annual (GSTR-9) GST Returns for Indian Railways. Dashboard for GST portal and Mobile App were developed. RFP was floated for CRIS to become IR GSP (GST Suvidha Provider).

Human Resources Management System (HRMS) – A number of important modules were developed in HRMS during the year, viz. Employee Master, e-Service Record, Employee Self-service, e-Pass, Settlement, Loans and Advances, e-APAR, and Grievance. Functionality to apply for PF loan was provided in mobile app of HRMS application. Approx. 90% cases of Normal Settlement were processed through HRMS application.

6. Resource Management - Material Management and Others

e-Procurement System (EPS) - Mobile App of User Depot Module (UDM) for Android was developed in-house and made available on Play Store for authorized Railway Users. CRIS PKI signer version 1.5, known as IREPS Signer, had been rolled out which enabled railway users to work in e-Tender module of IREPS in any browser. In Vendor Approval (UVAM) module, provision to facilitate transfer of request when an item is transferred from one approving agency to another, was introduced. For the first time, Indian Railway was able to sell scrap worth more than ₹5,000 crore.

e-Procurement System (EPS) - The “Indian Railways e-Procurement System (IREPS)” Version 7.1.0 was awarded the STQC Certificate under Ministry of Electronics & Information Technology guidelines. Shield Criteria Report was updated and improved. Performance indicators like tender setting time, % cases

re-tendered, average time taken in release of PO after agreement, implementation of UDM, etc. were included / updated for zone-wise performance comparison

RPF Security Helpline - Security related calls, Non security calls, and Addition/change of complaint type and sub complaint type were added. Requirement gathering for a new Meri Saheli module to be added to CRM (Crime Report Management) was initiated.

7. Dashboards, Integration and Analytics

Enterprise Architecture Phase 1 (IREA) – The API (Application Programming Interface) Management System including API Gateway (named Pravah) was installed on CRIS Cloud. Integration with Umang platform of Government of India was done for different IR applications through the API Gateway. Several other APIs with logistics and travel partners have been published through the API Gateway. Data Analytics Unit for Indian Railways (DAIR) - Roadmap for proliferation of Data Analytics on Indian Railways (documenting 93 use cases) was prepared with user involvement and submitted to Railway Board for further action.

Master Data Management Phase 1 (MDMS) - Single window of IR-Assets viz. Station, Loco, Coach and Wagon was published on Public Cloud MDMS on Main page-1) Display of IR Assets available All-India/Zone/division wise. 2) IR-MDMS Tender Published. 3) Integration of Mst. Wagon data has been started with FMM from 25th Feb.

e-Drishti - a dashboard for Indian Railways - Provision to display target of Capital Expenditure zone wise and fund source wise was provided through integration with IPAS. Design, development and rollout of dashboard tab for Rail Kaushal Vikas Yojana (RKVY) was done in eDrishti. Display of all types of Accidents (Consequential + Non-Consequential) was enabled in eDrishti after revised integration with SIMS Accidents application. Integration of IRPSM dashboard in eDrishti was carried out. Migration of eDrishti Mobile App backend to CRIS Private cloud infrastructure was completed. The Gati Shakti dashboard was linked with eDrishti. A new data entry and reporting module for Sectional Speed upto 110 Km was developed and rolled out.

8. Infrastructure, Business Continuity

Information Security Group Project – 1st Surveillance Audit of ISO-27001 was completed successfully without any major Non-compliance. Risk Assessment and Internal Audit of Application / Systems / Network devices completed as per schedule. Co-ordinated and ensured compliance with Alerts / Advisory issued by NCIIPC (National Critical Information Infrastructure Protection Centre) /CERT-In. Cert-In suggested the few changes in CRIS's Cyber Crisis Management Plan. Suggested changes are completed and document is again sent to Cert-In for approval.

Network Security Infrastructure - Around 4.66 lakh attacks were blocked in the month of March, 2022.

Data Sharing with NATGRID - ESB integration with FOIS and PMS done. Data integration tested with PRS and NGeT. API working status auto-check functionality developed and deployed.

Rail Cloud Phase 1 (RCLD) - 27 Development and 21 Production projects were on-boarded on CRIS cloud. Go-Live of CRIS Cloud expansion work was completed. Implementation of new backup policy with improved backup performance was completed.

Call and Appointment Management Software for MR's office – Reference File Management System (RFMS) was rolled out in MEITY, Department of Posts and Department of Telecom. An Integrated Reporting platform for Minister's office covering Meity and Communications ministry for comprehensive reporting was also rolled out.

Railway Officers Information System (ROIS) - CRIS team is regularly providing assistance to various Directorates and the MR's Cell, on ROIS working related issues in the Railway Board.

Website Maintenance - Tourist Circuit Train booking web application was developed. Bharat Gaurav Train Booking System was designed, developed and made online with online payment facility and integrated with MERS system. Jagjivan Ram RPF Academy, Lucknow website jrpf.a.indianrailways.gov.in. was made live on IR Portal infrastructure.

Indian Railway Finance Corporation Limited (IRFC)

Set up as a public limited company in December, 1986 with the sole objective of raising money from the market to part-finance the plan outlay of Ministry of Railways and for meeting their development needs. IRFC has been successfully meeting the borrowing targets set for it year after year. Funds are raised through issue of bonds, 54EC Capital Gain Bonds, Term loans from banks/financial institutions and through external commercial borrowings etc. The Department of Public Enterprises has consistently rated the company as "Excellent" for its performance vis-à-vis the parameters set out in the MoU.

The Company has leased rolling stock assets worth ₹2,83,633 crore to the Railways up to 31st March 2022. Rolling stock assets worth about ₹27,484 crore were financed during 2021-22. Funding has been made by IRFC in locomotives, wagons and coaches. The acquisition has helped in increasing traffic output and revenue growth in Indian Railways over the increasing traffic output and revenue growth in Indian Railways over the years. IRFC has also funded Railway projects through Institutional Finance to the extent of ₹1,47,378 crore till 31st March, 2022. Besides, earlier IRFC has also funded National projects worth ₹7,578.70 crore and Railway Projects under EBR-S worth ₹50,551 crore up to 31st March, 2022.

Rolling stock assets funded by IRFC are leased to Ministry of Railways. IRFC has successfully brought down lease rentals from 17.5% p.a. in 1996-97 to

10.5187% p.a. in 2021-22, which compares favourably with the borrowing of the Government of India. The Ministry has been making lease payments to IRFC regularly.

The company has also disbursed loans amounting to ₹7,865 crore to Rail Vikash Nigam Limited (RVNL) till the end of fiscal year 2021-22 for development of Railway Projects.

IRFC has consistent profit earning track record. It has so far paid ₹6,822.79 crore as dividend to the Government. Based on its strong financial strength and credit standing, it has got the highest possible rating from three prominent domestic Credit Rating Agencies and investment rating at par with 'Sovereign' from four major International Credit Ratings Agencies.

IRFC has also become the first Central Public Sector Enterprise (CPSE) to list its USD 500 million green offshore bonds exclusively at NSE-IFSC and India INX in the GIFT City (Gujarat International Finance Tech City), Gandhinagar.

Also IRFC has been ranked 96th in Fortune India 500 list of companies based on financials of fiscal year 2020-21.

Konkan Railway Corporation Limited (KRCL)

The Company was established in the year 1990 with equity participation by Ministry of Railways (51%), Maharashtra (22%), Karnataka (15%), Kerala (6%) and Goa (6%) for the purpose of construction and operation of Railway along the Western Coast of India.

FINANCIAL PERFORMANCE

Key Financial Highlights:

PARTICULARS	(₹in crore)	
	2020-21	2021-22
Total Income	1,657.48	3,307.16
Operating Margin	(-)162.33	124.28
Profit After Tax	(-) 365.26	(-) 135.08
Net Worth	1,548.46	1,431.97

TRAIN OPERATING PERFORMANCE

During the year, on an average 47 pairs of Mail/Express trains and 05 pairs of passenger trains were scheduled to run over Konkan Railway route. However, due to COVID-19 pandemic situation, as a precautionary measure, regular passenger train operation remained suspended till 14.11.2021. Only special trains were operated for convenience of traveling public. Operation of regular trains was commenced from 15.11.2021 onwards. During this period, Mail/ Express/ Passenger special, Festival special, Election special, FTR special, Bharat Darshan and Parcel special were run. A total of 30 Nos of Parcel trains were run on KRCL route during the year in co-ordination with Zonal Railways to facilitate movements of essential commodities, equipment, medicines, perishable

items etc. A total of 7,865 Nos. of Special trains were run during the year. During Ganpati festival, a total 256 Nos. of special trains were operated for devotees traveling to Konkan region from Mumbai and back. Special trains were also operated during the festival of Holi, Anganewadi yatra and other occasions to clear extra rush of passengers. Suspension of regular passenger train operation during the year till the month of October, 2021 had affected coaching revenue of the year 2021-22. However, the Coaching revenue during the year increased to ₹602.84 crore as compared to ₹200.70 crore during the previous year 2020-21, as more number of trains were run due to relaxation in restrictions during the year.

On the freight front during the year 2021-22, on an average 15 freight trains per day including “Roll-On Roll Off” services were run on Konkan Railway. The freight revenue during the financial year was ₹543.14 crore, which is 40% more than that of previous year’s ₹387.94 crore.

Operationalization of Indo-Nepal Cross Border Railway: During the year 2021-22, Corporation has undertaken the operations & maintenance of Jaynagar - Kurtha Railway line for a period of one year. At present, two up and two down trains are running on the line every day.

PROJECT PERFORMANCE

Udhampur-Srinagar-Baramulla Rail Link (USBRL PROJECT, J&K): The Corporation has completed 43.06 km tunnel excavation, out of total 45.24 km while constructing Katra-Dharam Section of Udhampur-Srinagar-Baramulla Rail Link (USBRL) Project. 5.36 km of tunnel excavation, 9.518 km of Tunnel Lining and 6,597 MT of launching have been completed during the year. A turnover of ₹1944.87 crore (excluding GST) was achieved from the Project during the year, as compared to ₹827.21 crore (excluding GST) of the last year 2020-21.

Anakkampoyil - Kalladi- Meppadi Tunnel Road Project: Government of Kerala has assigned to the Corporation, as Special Purpose Vehicle (SPV), the execution of the Anakkampoyil- Kalladi- Meppadi Tunnel Road Project. A Tripartite Agreement has been signed between Konkan Railway, Public Works (H) Department, Government of Kerala and Kerala Infrastructure Investment Fund Board (KIIFB) to implement the project. Corporation has prepared DPR for Twin Tube unidirectional Tunnel with 4 lane approach road and two parallel major bridges at southern end at an estimated cost of ₹2043.74 Crore. Administrative sanction for DPR from Government of Kerala has been received. Land acquisition, Environment clearance and Tender process are in progress.

Central Railway Rolling Stock Component Factory at Ratnagiri: The construction of Rolling Stock Component Factory (RSCF) for Central Railway is progressing well. The project is expected to be completed by March, 2023. The cluster-1 of the factory being constructed for overhauling of LHB bogies is planned to overhaul 300 LHB bogies per month in the factory.

Rail connectivity to Vizhinjam International Seaport, Kerala: An MoU has been signed between the Company and Vizhinjam International Seaport Ltd. (VISL) to link the Vizhinjam Seaport with Southern Railway (11 km). The Detailed Project Report (DPR) with an estimated cost of ₹1,060 crore has been approved by Southern Railway under NGR model. Land acquisition and final documentation for the project are in progress.

RailTel Corporation of India Limited (RailTel)

RailTel corporation of India Ltd. (Mini Ratna Category-1 CPSU), was formed on 26th September, 2000 to facilitate Railways in expeditiously modernizing train operation and safety systems by providing state of art communication network infrastructure to Indian Railways through an internal entity. Formed with an authorized capital of ₹1,000 crore and an exclusive Right of Way (ROW) of the 68,103 RKM of Indian Railways network, the PSU started functioning with a hand full of talented, experienced and motivated Signalling & Telecommunication engineers of Indian Railways.

Over the years, it has grown from a small entity to one of the largest secure Neutral Telecom Services Provider in the country and an ICT service provider. It has two UPTIME, USA certified Tier-III Data centers and MeitY empaneled Railcloud. The biggest USP of RailTel is its ownership of a Pan India 61000+ RKM of optic fibre network with access network of 21000+ KM, including North Eastern States covering all important towns & cities and several rural areas. RailTel occupies a proud place with its unparalleled networking high bandwidth backbone segment. The network has the ability to provide mission critical customized connectivity platform for enhanced efficiency and growth. Presently this network is available at more than 800 cities in multiple rings of STM-64/16.

RailTel Network have capability of service delivery from 2mbps to 800Gbps links and comprises of various technologies viz. Next generation Network (NGN), Synchronous Digital Hierarchy (SDH), Packet Transport Network (PTN), Dense Wavelength Division Multiplexing (DWDM), Internet Protocol-Multi Protocol Label Switching (IP-MPLS) which are maintained round the clock by Network Operation Centres and trained field manpower. All the equipment provided on the network are of State-of-the-Art Technology and are as per International Telecom Standards.

The company has diversified into many fields offering a bundle of services viz. Internet Bandwidth, leased lines, Tower Co-location, HD Video Conferencing service, MPLS-VPN services, Data Centre services such as Co-location Hosting, Managed Services, Cloud computing Services, Data recovery services e-office implementation, HMIS (Hospital Management Information System), Security Operation Centre as a service (SOCaaS) & IT enabled services etc. to private and Government clients.

Financial Performance

		(₹ in crore)
Year	2020-21	2021-22
Total Revenue	1411	1628
Profit before tax	196	281
Profit after tax	142	209
Earnings per share	4.44	6.51
Revenue share to Railways	30.68	39.72
License fee to DoT	56.56	66.79

Focus Areas

Hospital Management Information System (HMIS)

RailTel has completed the work of providing Hospital Management Information System over 699 Hospitals/Health Units/ polyclinics of IR. This is integrated clinical information system for improved hospital administration and patient health care for providing an accurate, electronically stored medical record.

To minimize footfall at Railway hospitals/ Health units for generic treatments, a teleconsultation app and HMIS beneficiary app has been developed and integrated with the (HMIS). The beneficiary app enables the medical beneficiaries to access their medical record at a single point. Railway HMIS has also been integrated with Ayushman Bharat Digital Mission (ABDM).

Station Wi-Fi

RailTel is transforming Railway stations into Digital hubs by providing public Wi-Fi at all railway stations. 6,100+ stations are live with RailTel's RailWire Wi-Fi including 15 Station of Kashmir valley. This is one of the largest and fastest public Wi-Fi networks of the world. Passengers use this facility for streaming High Definition (HD) Videos, download of movies, songs, game, and do their office work online. Out of the stations commissioned 70% are in rural areas which are bringing free high-speed Wi-Fi services in the vicinity of a major chunk of rural population. Company has now introduced paid Wi-fi service at a nominal charge for Rail users looking for high speed after initial 30 mins of free usage. Utilizing POPs at rural stations, it proposes to extend connectivity to villages and the Wi-fi infrastructure will also be used to provide access under PM WANI project.

Security Operation Centre

To provide a centralized and consolidated cyber security solution to organizations, company has set up a Security Operation Centre (SoC) at Gurugram. It provides onsite and offsite cyber security incident prevention and security event monitoring services. The services provided through SOC are Security information and event management solutions, Endpoint detection and response, which provides host level telemetry for both near real-time as well

as forensic investigation, Network traffic analysis used to investigate alerts and obtain additional context about suspicious activity in the network, Packet capture for forensics, Sandbox for malware analytics, Vulnerability assessment tools, Web application and network firewalls and Auto ticketing tool.

E-office in Indian Railways

RailTel started implementation of e-office over IR to bring more efficient, effective and transparent government transactions and processes. e-Office is a Cloud Enabled Software Application developed by NIC, hosted at RailTel Tier-III Certified Data Centre at Secunderabad with Disaster recovery at Gurugram. e-Office has been implemented in all 216 Units of Indian Railways. As on date, more than 1.39+ lakh users of Indian Railways are using e-Office Application. E-office has proven to be boon in a crisis time and part of Railway workforce was able to WORK FROM HOME, which would have been impossible in case of manual filing system. Company has also provided this service to other PSUs such as DFCCIL, IRCON, RVNL, IRCTC and CWC etc.

HD Video Conference

Service RailTel's offers an end-to-end, full high-definition video conferencing service that gives users a virtual, face-to-face meeting experience. Before adoption of Video Conference Service, Indian Railways were spending huge amount of money/man hours for meetings /events, now number of travels for meetings/events has dropped drastically saving man hour, travel & lodging expenses. This has also helped in saving significant amount of carbon footprint. The success is a result of the significant ease of use & 24X7 customer responsiveness of the RailTel team vis-a-vis the challenges faced with other service providers. Post covid there has been exponential growth in the usage of video conferencing services provided by RailTel. This HD video conference service is being provided for many prestigious events of national importance.

Video Surveillance System (VSS)

RailTel is also executing provision of IP camera-based Video Surveillance System at 5000+ railway stations. This will go a long way in enhancing the safety and security of the passengers travelling over the IR network. RailTel is also integrating the various standalone video surveillance system installed at various stations by respective zonal railways so that the video recordings can be seen and monitored at the Divisional and Zonal head quarter level centrally. The system shall provide high-capacity storage devices at stations to store recording of CCTV footage for a defined period. Work has been completed at 303 stations under Phase-1.

Tunnel Radio Communication

RailTel is executing the work of installing state-of-the-art Integrated Tunnel Radio Communication System at a number of crucial Railway tunnels in difficult terrains to improve operational safety. Currently RailTel is executing this system for Katra-Banihal section of Northern Railway, Panvel-Karjat, Karjat-Lonavala

and Kasara-Igatpuri section of Central Railway and Castle Rock-Kulem section (Braganza Ghat) of South Western Railway. Communication inside the tunnels is interrupted due to poor signal coverage, which can hamper train operation & maintenance activities. This state-of-the-art Integrated Tunnel communication system is designed to provide uninterrupted radio communication between handheld radios inside tunnel, to the base station at tunnel control rooms and Station Masters of adjacent stations. The Technology being used in these projects is a first for Indian Railways.

RailWire –Retail Broadband Service

It is a collaborative model in partnership with local entrepreneurs & local cable operators for providing Last Mile Connectivity. There are more than 4.72 lakh + RailWire broadband customers in the SMEs/household segment. Due to high SLAs & last mile connectivity, this is suitable for providing rural connectivity at Gram Panchayat/village levels as well as for connecting banks and other Government institutions. Using the Point of Presence (PoP) of existing station Wi-Fi at rural stations, the company is extending the service to a number of nearby villages and towns. The aim is to bring RailWire broadband to 1 lakh such villages across the country.

Data Center & RailCloud

RailTel has two UPTIME (USA) certified Tier-III Data Centers at Secunderabad and Gurugram & a MeitY Empaneled “RailCloud”. Company offers a host of Data Centre & Cloud services like Colocation Services, Managed services, Cloud Computing, Managed e-Office, Aadhaar Authentication Services, Dedicated Solutions etc, from these two state-of- the-Art Data Centres with combined total gross capacity of more than 6000 Sq.ft Server Farm area. RailTel cloud services are backed by SLA of 99.95% and co-location services by SLA's of 99.983% which is one of the best by industry standard. Besides Indian Railways, a number of Government customers trust RailTel for the Data Centre services.

Modernization of Signaling System

RailTel Enterprises Ltd, a wholly owned subsidiary of RailTel Corporation of India Ltd., has been awarded the work of replacement of old mechanical signaling equipment with state-of the-art electronic interlocking system at 26 stations of Northern Railway. The existing mechanical signaling systems are using lever frames to both lower the signal and change the tracks. The new Electronic Interlocking signaling system will now enable lowering the signal and changing of tracks by click of a mouse and will enhance safety and improve efficiency of train operation.

ICT Advantage to Coal, Defence, Banking & Education Sector

RailTel is one of the pioneers in providing MPLS- VPN, Point to Point connectivity & Data Centre services to companies of Coal, Defence, Banking & Education sector. RailTel is serving public sectors and private sector banks by providing Virtual Private Network connectivity and point to point connectivity.

Further, various solutions are offered to various Government & Private educational institution and universities viz 758 institutions of Higher learning including IITs, IIMs, Medical colleges etc. connected on RailTel network as part of NKN, Campus Wi-Fi provided at 26 Central Universities, Connectivity to 1,295 Govt. schools and Education offices in Kerala, Connectivity & Bandwidth to other 109 Universities and Schools. RailTel is also supporting various state governments in their State Wide Area Network (SWAN).

IOT Project

RailTel is also executing project of making available IOT based Data from various civil engineering assets, Drone recording of track and CCTV camera feed from projects sites on a common Indian Railway Telemetry application Platform. It has deployed IoT Based Condition Monitoring and Predictive Maintenance system for Signalling assets as at one station on South Central Railway on trial.

PM WANI

PM-WANI is ambitious program to connect all silo of Wi-Fi networks for ease of use and proliferate seamless broadband usage for masses. RailTel being the most widespread integrated Wi-Fi network of country supporting the largest footfall of Wi-Fi users, will play an anchor role in entire PM-WANI ecosystem, by continuous engagement with regulatory bodies and industry players. It has already been registered as Public Data Office Aggregator (PDOA) and has obtained provisional PDOA certificate from CDOT. The Payment channel integration is already completed with payment aggregators. Interop Testing to check seamless roaming from one PDOA network to other PDOA, has been done with CDOT.

Corporate Social Responsibility

RailTel has contributed an amount of ₹369.60 Lakh in FY 2021-22 in CSR initiatives that focusses on supporting underprivileged students for engineering entrance exam coaching, cancer patients, specially abled children, adolescent girls, women empowerment etc.

Indian Railway Catering And Tourism Corporation Limited (IRCTC)

IRCTC founded on 27th September, 1999 as a wholly owned Government of India enterprise under the administrative control of the Ministry of Railways, is the only entity mandated to provide railway tickets, catering services to railways, and packaged drinking water with tourism and hospitality services over Indian Railways network.

During FY 21-22, the Company achieved total income of ₹1,952.30 crore, as compared to ₹761.64 crore in the FY 2020-21. The Company earned a Profit before tax of ₹889.51 crore in 2021-22 as compared to ₹257.51 crore in 2020-21 and Profit after tax of ₹663.69 crore in 2021-22 as compared to ₹187.02 crore in 2020-21.

The core activities of the Company are detailed below:

Catering & Hospitality

IRCTC is one of the country's leading hospitality enterprises serving to railway passengers. IRCTC provides onboard catering services on all passenger trains across the Indian Railway network.

IRCTC also manages the on-board catering services of various premium trains such as Gatimaan, Tejas and Vande Bharat and has redefined the catering experience in these trains by offering elaborate premium services. Besides, the company also manages a number of static catering units at stations such as 306 Food Plazas and Food Courts, 180 Refreshment Rooms, 55 Jan Ahaar outlets etc

Understanding the need to provide the rail passengers with state of art and quality waiting facilities at stations during transit coupled with the facility of food and beverage services and other recreational services, IRCTC has redefined and upgraded the travel experience of the passengers by introducing various new concepts such as Executive lounges and POD. Accordingly IRCTC has set up 10 executive lounges at important Railway stations such as New Delhi, Agra, Jaipur, Ahmedabad, Varanasi, etc. and has launched POD at Mumbai Central railway station which has been received very well by the passenger fraternity.

Food delivery on train seat to travelling passengers through e-catering is a new initiative. This is proposed to be achieved through IRCTC's e-catering website (ecatering.irctc.co.in), Food on Track app, through phone by dialing 1,323 and also through WhatsApp (+91-7042062070).

Travel and Tourism

IRCTC is one of the leading travel and tourism companies in the country and is also a major player in the field of Online Travel Agency (OTA) business with its presence in almost all forms of tourism activities. IRCTC specializes in mass tourism business with its Special Tourist Trains in budget segment being patronized by a large number of domestic tourists annually. Besides, the company also operates luxury tourist trains such as Maharajas' Express and Golden Chariot for the upscale market and Deluxe Tourist Trains for the mid-segment tourists.

Medical Tourism

IRCTC has recently started the services of online medical tourism packages for the customers. With a substantial network of hospitals, nursing homes and diagnostic centres empanelled with its technical partner (medico-technical online services company), IRCTC is offering medical treatment and wellness packages to the customers at highly competitive prices.

Internet Ticketing

IRCTC has been the pioneer of internet based railway ticketing in the country. The company has been instrumental in development of an internet based railway ticket booking platform in the form of website and app for the customers which has facilitated the customers in booking railway tickets without

the need to visit railway stations. Today, the company's website www.irctc.co.in is the most visited e-commerce site in the entire South East Asia and the company books an average of 12 lakh railway reserved tickets through its website and app.

Rail Neer Packaged Drinking Water

Rail Neer packaged drinking water is one of the most trust brands of drinking water in the country today. Rail Neer is exclusively sold in trains and stalls at Railway Stations. At present IRCTC has 15 operational Rail Neer Plants across the country with a daily production capacity of 14.80 lakh litres and recorded a production of 7.53 Crore bottles.

Azadi Ka Amrit Mahotsav is an initiative of the Government of India to celebrate and commemorate 75 years of independence and the glorious history of its people, culture and achievements. To celebrate the Azadi Ka Amrit Mahotsav IRCTC has been organizing various events and activities since its official journey commenced on 12th March, 2021 (that is a 75-week countdown to 75th anniversary of independence) and will end post a year on 15th August, 2023.

Major Activities during Celebration of Azadi Ka Amrit Mahotsav (AKAM)

- **Environmental Friendly Gesture:** - IRCTC has planted more than 1000 saplings at its Rail Neer packaged drinking water plants and zonal/regional offices across India.
- **Blood Donation Camps** were organized by IRCTC Corporate Office & North to celebrate "Azadi ka Amrit Mahotsav". IRCTC staff and officials donated blood with proud hearts. More than 40 units of blood was collected. Collected blood was sent to Regional Blood Transfusion Centre. It will be utilized to provide to patients on "no replacement basis" and is provided free to Thalassaemic patients, BPL patients and patients and other deserving patients.

IRCTC has printed the logo of AKAM (Azadi Ka Amrit Mahotsav) on its Rail Neer bottle so as to promote the celebration of this mega event.

Pipavav Railway Corporation Limited (PRCL)

Pipavav Railway Corporation Limited (PRCL), the flagship Joint Venture Company of Ministry of Railways and Gujarat Pipavav Port Limited (GPPL) was formed to execute the Surendranagar – Rajula – Pipavav Port (APM Terminals, Pipavav) gauge conversion & new line project. This is the first railway infrastructure project executed through private sector participation. PRCL has concessionaire rights to construct, operate and maintain this project line for 33 years. PRCL has been given the status of a non-Government Railway Administration enumerated in the Railways Act, 1989.

The comparative figures of 2020-21 and 2021-22 are: -

	2020-21	2021-22
Number of single stack Container trains	2,443	1,718
Number of Double Stack containers trains	1,764	1,914
Total container	4,207	3,632
Number of Bulk trains	906	848
Number of empty trains run	754	752
Total number of trains run	5,867	5,232
Traffic volume (in Million Tonnes)	7.72	6.93
TEU's Loading	2,79,158	2,58,054
Gross Apportioned freight earnings (₹in crore)	219.79	195.86
Net Profit (₹in crore)	26.05	10.54
Net Worth as per audited financial statements (₹in crore)	657.77	668.31
Number of passenger trains	19 pairs	19 pairs**

**includes 9 express / Superfast trains, which are running weekly, 10 mail / express / passenger trains run daily.

PRCL had obtained a Category-III License for container train operations in the year 2006 on payment of license fee of Rs.10 crore. The Company was able to operationalize this license by running few container trains in 2009-10 in collaboration with another private entity. PRCL explored business opportunities and tied up with M/s Maersk Line India Private Limited, one of the leading shipping lines, GPPL, M/s THAR Dry Port and other service providers in the process of starting the new business vertical within PRCL. A BLCS Rake was taken on lease and first train was run ex Pipavav Port to Bhagat ki Kothi in Jodhpur (Rajasthan) on 21/09/2021. The Company has now drawn up firm plans of ramping up this business during 2022.

Accordingly, 75 trips rakes of container trains have been run to different destinations (Jamnagar, Bhagat Ki Kothi, Sanand etc.) from Pipavav Port Siding during FY 2021-22. The Company has generated revenue of ₹9.83 crore (including GST) from CTO operations and paid ₹6.52 crore (including GST) as haulage charges to Western Railway during 2021-22.

Western Railway has notified Pipavav Station of Bhavnagar Division as an SPV terminal of PRCL for handling inward and outward goods traffic, except container, in the month of September, 2021.

After commissioning of LPG siding at Pipavav Port and loading of 1st rake on 09-01-2021, there has been regular movement of LPG. During FY 2021-22, total 245 rakes of LPG were loaded, with highest loading of 34 rakes in the month of January, 2022.

Rail Vikas Nigam Limited (RVNL)

Rail Vikas Nigam Limited (BSE|NSE: RVNL) is a Category-I Miniratna CPSE under the Ministry of Railways. It was incorporated in 2003 to meet the country's infrastructure deficit and implement projects on a fast-track basis. RVNL

works as the executing arm of the Ministry of Railways for project implementation and transportation infrastructure development.

The organization undertakes project execution from concept to commissioning and creates project- specific SPVs. RVNL's mandate includes the mobilization of extra-budgetary resources (EBRs) through a mix of equity and debt via these SPVs.

Significant Project Achievements 2021-22

- **During FY 2021-22, RVNL has been successful in completing and commissioning two Gauge Conversion projects namely:**
 1. Dhasa-Jetalsar Gauge Conversion project (104.44 Km)
 2. Ahmedabad – Botad Gauge Conversion project (170.48 km)
- **Three Doubling projects completed and commissioned in the FY 2021-22 are mentioned below:**
 1. Secunderabad-Mehboobnagar Doubling project (85.24 km)
 2. Raebareli - Amethi Doubling project (60.1 km)
 3. Utratia-Rae Bareli Doubling project (65.6 km)
- **Successful completion and commissioning of four railway electrification projects in the FY 2021-22, as listed below:**
 1. Raninagar Jalpaigudi-New Bongaigaon (incl.)- RE 374.98 Guwahati (incl.)-382 rkm
 2. Chikjajur-Bellary (184 rkm)
 3. Bengaluru-Omalur via Hosur (196 rkm)
 4. 2nd Line Utratia-Raebareli-Amethi (126 rkm)
- **During the FY 2021-22, 5 Workshop projects were completed as listed below:**
 1. Gaya -Setting up New MEMU car shed for WS - maintaining 30 rakes of 16 coaches
 2. Sonipat-Setting up of coach periodical overhauling and refurbishment workshop
 3. Saidpur Bhitri- Setting up of electric loco shed to WS - home 200 locos
 4. Jheel Siding Coaching Depot (Part-I) – Augmentation
 5. Augmentation of EMU car shed, Ranaghat (Part-I)

Significant Project Achievements 2022-23

Daund-Gulbarga Doubling Project (224.9 km):

28.5-km long Bhigwan – Washimbe section was in August, 2022. With this commissioning, the Daund – Gulbaraga Doubling project has been commissioned.

Vijayawada-Gudivada Doubling project:

The Vijayawada – Gudivada Doubling project has been fully commissioned in July, 2022.

Special Purpose Vehicles

-RVNL has promoted SPVs to attract private participation in the development of Railway Infrastructure. RVNL has generated revenue of ₹86,121.97crore for Indian Railways without any investment from the Ministry as on 31.03.2022. The Company has an equity contribution of ₹1,133.05 core in the 6 SPVs.

Financial Performance

In 2021-22, RVNL increased its expenditure on project execution from ₹15,403.65 crore to ₹19,381.71 crore, excluding the element of ₹2,325.81 crore as GST. This reflects an increase of 25.83%. Profit Before Tax increased from ₹1,155.67crore in 2020-21 to ₹1,406.10 crore in 2021-22, and Profit After Tax (PAT) of the Company is at ₹1,087.21 crore, showing an increase of 15.59% over the previous year.

	(₹ in crore)	
Financial Year	2020-21	2021-22
Total turnover	15,403.65	19,381
Profit before tax	1,155.67	1,402.53
Profit after tax	940.55	1,087.21

DPE rating

RVNL has been rated as “Excellent” by the Department of Public Enterprises (DPE) for 11 consecutive years. The Company has been ranked 1st amongst the Railway PSEs and 3rd amongst PSUs in the country in the latest DPE ratings 2020-21 with a MoU Score of 99.

Other Accolades

Rail Vikas Nigam Limited bagged the Dun & Bradstreet’s “India’s Top PSUs - 2021” Award as the best performer in the category of “Contract, Construction & Consultancy Services”.

Rail Vikas Nigam Limited bagged the PSU Excellence Award Corporate Governance Awards from Greentech Foundation for FY 2021.

Quality Accreditations

During the Year 2021-22, RVNL also achieved three ISO Certifications viz. 45001:2018, 9001:2015 & 14001:2015 in the fields of Occupational Health & Safety Management System, Quality Management System and Environmental Management System.

Rail Land Development Authority (RLDA)

Rail Land Development Authority (RLDA) is a statutory Authority, under the Ministry of Railways, set-up by an Amendment to the Railways Act, 1989, for development of Railway Land as entrusted by the Central Government for commercial use for the purpose of generating revenue by non-tariff measures. RLDA has been constituted in terms of Extraordinary Gazette Notification dated 31.10.2006, as amended on 05.01.2007. The Rules for functioning of RLDA have also been notified in the Extraordinary Gazette dated 04.01.2007.

1.1 Functions of RLDA

In terms of Section 4(D), RLDA has to discharge functions & exercise such powers of the Central Govt. in relation to the development of Railway land as are specifically assigned to it by the Railway Board. In terms of section 4E of the Act, specifically subject to such directions as may be given to it by Central Government, RLDA has been empowered to enter into agreement on behalf of Central Government and execute contracts.

In terms of section 24 of RLDA (Constitution) Rule 2007, the Authority may set up any special purpose vehicle, joint venture or other legal entities for the performance of all or any of its functions under the Act with the approval of Central Government.

Business of the Authority

1.2 Commercial Development of Vacant Railway Land

Sites for commercial development are entrusted to RLDA by the Ministry of Railways. During the year 2021-22, total earning of ₹383 crores have been realized by RLDA. The number of sites for commercial development with RLDA is 145 which include 18 stadiums and 4 Railway lines (Darjelling Himalayan Railway, Kalka Shimla Railway, Neral-Matheran Railway, & Nilgiri Mountain Railway) in 2021-22.

In the beginning of the year 2021-22, RLDA had been entrusted with 91 sites. During this period, RLDA had identified 54 new sites (39 commercial sites + 15 stadiums) for commercial development. Letters of Acceptance (LOA) for 9 commercial sites have been issued out of which LOA of 3 sites have been cancelled on account of non-payment of 1st installment of lease premium by selected bidder. RLDA has realized net earnings of ₹383 crore during 2021-22.

1.3 Construction of Multi-Functional Complexes (MFCs)

Land for MFCs is leased to PSUs on 30 to 45 years lease on revenue sharing model. However, RLDA adopted combination model (upfront Lease Premium and fixed Annual Lease Rent model) for development through private developers for which bidders are selected through open competitive and transparent bidding process. In all, 40 MFCs were assigned to PSUs for development [IRCON (24), RITES (14), and RVNL (02)], out of these 40 MFCs, 24 MFCs have been commissioned by IRCON. However, as per the directions of

the Railway Board, 14 MFC Buildings completed by RITES have been handed over back to Railways without any cost. RVNL has also handed over 02 nos MFCs to concerned Zonal Railways.

LOAs for 06 Nos MFC sites namely Tata Nagar, Rohtak, Raja ki Mandi, Sikar, Sasaram and Purulia issued during 2021-22.

1.4 Redevelopment of Stations

Presently, total 181 nos. of stations, in different states of the country have been entrusted with RLDA by the Railway Board for redevelopment. Construction work completed at Gandhinagar Capital and Rani Kamalapati railway stations. Construction work is in progress at Bijwasan, Gomtinagar (with NBCC), Delhi Safdarjung (with IRCON) and IMS, Ajni/Nagpur (with NHAI) in EPC mode.

Dedicated Freight Corridor Corporation of India Limited (DFCCIL)

About DFCCIL

Dedicated Freight Corridor Corporation of India Limited (DFCCIL) is a public sector undertaking under the administrative control of the Government of India (Ministry of Railways). The golden quadrilateral and the diagonal linking of the four major metropolitan cities of Delhi, Mumbai, Chennai and Kolkata are strategically important to Indian Railways. This route comprises 16% of the total route but, carries 52% of passenger traffic and 58% of freight traffic. The Eastern corridor (Kolkata-Delhi) and the Western corridor (Mumbai-Delhi) were highly saturated. Dedicated Freight Corridor (DFC) was formed to decongest the saturated road network and promote rail freight transport while ensuring efficiency and enabling significant reduction of Green House Gas (GHG) emissions. Total scope of Dedicated Freight Corridors is 2,843 km route (additional 538 km Son Nagar-Dankuni section is planned to be executed through PPP mode).

Advantages of DFCCIL

- The unit cost of transport is expected to get reduced by 40%.
- DFC routes are constructed with the double lines and are also provided with automatic signalling thereby more than 120 trains can be run in each direction. Initially, it is planned to divert 70% of the freight traffic running on the parallel routes of Indian Railways and during the course of time, the road traffic will also get diverted to rail as DFCs will provide very efficient, economical, safe and faster mode of transport.
- Industrial corridors are also coming up along the Eastern DFC and Western DFC.
- Savings of 457 million tonnes of CO₂ emission over a 30-year period.

Significant Achievements of the Year 2021-22

- 620 km of DFC was commissioned during the FY 2021-22 taking the

cumulative commissioned route length to 1277 Km which is 45% of the total DFC network.

- Madar - Palanpur Section (353 km) of WDFC was commissioned and made operational during the FY 2021-22.
- Rooma - Sujatpur (130 Km) section of EDFC was commissioned for freight train operation
- A Freight train on DFC clocked a record average speed of 99.38 kmph which is faster than average speed of Rajdhani trains. This feat was achieved on the 351 km New Khurja-New Bhaupur section of the Eastern Dedicated Freight Corridor (EDFC).
- ROB no. 227 near Pansar station of Indian Railways (DFC block section Ghumasan-Sanand North) was inaugurated on 21.06.2021.
- New DDU to New Sonnagar (137 Km) of EDFC was commissioned for freight trains on 31.03.2021.
- Diesel loco trial was conducted between New Palanpur to New Mehsana on 31.03.2022.
- Diesel loco trial was conducted between Prithala to Bridge no.185 (Noida - Greater Noida expressway) on 31.03.2022.
- MOU was signed with Indian Institute of Science (IISc) for developing Machine Vision Based Inspection of Rolling Stock (MVIS) which would detect en-route freight unusual at high speed.
- MOU between Eastern Railway and DFCCIL was signed for supply of 140T break down crane.
- Trucks on Trains (ToT) service started between New Rewari (Haryana) to New Palanpur (Gujarat) section on 12.08.2021. It reduced transportation time from more than 30 hrs to less than 15 hrs from Rewari-Palanpur. The Trucks on Trains service is poised to be a game changer with assured savings in time, fuel and cost along with reduction in greenhouse gas emissions. More than 167 ToT services have been successfully operated as on 31.03.2022. 167 services were run between New Rewari - New Palanpur - New Rewari. 3,456 trucks were taken off the road and an earning of INR 1,051 Lakh was realised with the saving of 8.3 lakh litres of fossil fuel and reduction of 2,190 tonnes of CO2 emissions thereby improving nation's carbon footprint.
- CONCOR's CMLK (Kathuwas) becomes the first terminal to get direct connectivity with WDFC. CONCOR MMLP is now linked with Madar-Palanpur section.
- DFCCIL was connected to Banas and Keshavganj Sidings of North Western Railway. This will provide better connectivity to these sidings.

- Newly constructed office for Noida unit was inaugurated by the Managing Director on 26.12.2021.

Progress of Works

- The project has witnessed a significant leap in the progress of Civil, Electrical and S&T construction works with commissioning and successful trial runs of Freight trains in both Eastern and Western Corridors after completion of Civil, Electrical and Signalling & Telecommunication (S&T) work.
- Track linking of 842 km was done during the year taking the cumulative linking to 4,164 TKm.
- The OHE wiring by Mechanized wiring train started for the first time in India in both EDFC and WDFC. OHE wiring of 451 km was completed in the year 2021-22. Cumulative 3110 TKm OHE wiring has been completed till 31.03.2022.
- DFCCIL achieved CAPEX of ₹14,649 crore (including land), which is highest ever Capital Expenditure. This increase is despite restriction due to the lockdowns of the second and third wave due to coronavirus.

Land Acquisition

- The total award u/s 20F declared so far in 2021 - 22 is 120.90 Ha & the cumulative figure is 11,774 Ha of land. The total disbursal of compensation is ₹759 crore in 2021-22 and the cumulative award is ₹16,427 crore.

Business Development, Operations & Safety

With the commencement of operations in the already commissioned sections, the role of Operations Business Development has assumed great importance.

- 25,795 freight trains have been run in the commissioned sections. Cumulative freight carried is 21,901 Million GTKM since the commissioning. Average speed of trains is around 55 kmph, substantially higher than average speed of freight trains in Indian Railways. As newer sections continue to be added to the operational sections, the GTKMs and the NTKMs shall increase in leaps and bounds as greater connectivity and access to Indian Railways is provided. Average speeds on commissioned sections of both the corridors as well as the parallel Indian Railways sections have registered continual improvement on monthly basis as the congestion in these areas has been eased out and relegated to history.
- Millennium (Milk) special trains are being run on WDFC (26 trains up to March, 2022), with an average speed of 76.63 kmph, revolutionising the way perishables are transported and ensuring that the dairy products are quickly transported.

- With an eye on economising on Diesel fuel consumption, the DFCs were electrified and therefore, the associated sidings have also been electrified. A Train-examination facility is also being set up at New Rewari station.
- Station working Rules/ TWIs (Temporary Working Instructions)/ Safety circulars/Bulletins were scrutinised and approved, for the sections commissioned during 2021-22, institutionalising the system of train operations, enhancing safer train operations.

The DFC model is creating superior value for its stakeholders. Government is striving to enhance the Rail share in country's freight transport from 27% to 45% as per National Rail Plan on economic and environmental considerations, in which DFCs will play a very important role owing to the reduced transit time and lower logistics cost. The uninterrupted long-runs and reduced transit time will result in need for lesser rolling stock and train crew, hence optimising the resources. The DFC will result in shifting of freight traffic over it and will thus spare capacity for the Indian Railways which will enable more passenger rail services. The DFC is also eliminating more than 850 level crossings across golden quadrilateral, enhancing overall safety. The DFC will facilitate easy trade by reducing the transit time to less than 24 hours from ports of western India to Delhi NCR. It is also enabling the development of logistics hub along the corridor, reducing transportation costs, making indigenous products more competitive in the international market.

Mumbai Railway Vikas Corporation Ltd. (MRVC)

1.1 Mumbai Railway Vikas Corporation Ltd (MRVC Ltd), is a PSU of Government of India under Ministry of Railways (MOR), executing the Rail Component of the MUTP.

1.2 Mumbai Urban Transport Project – I

- MUTP I was sanctioned in Railway Budget 2003-04. It was successfully completed in 2012 and its completion cost was ₹4452 crore.
- Major Infrastructural Inputs in MUTP Phase - I (Rail Component)
- Addition of 93 track Kms. (5th and 6th lines Kurla-Thane, 3rd and 4th lines Borivali-Virar)
- Induction of 101 new 9-car rakes (909 coaches)
- Resettlement & Rehabilitation of 15,857 Project affected households.
- Running of 12-car rakes on all lines (excluding Harbour Line) by extending the length of all platforms
- 1500 V DC to 25k V AC conversion on Central & Western Railway – Traction conversion work on entire Western Railway.

1.3 Mumbai Urban Transport Project -II

MUTP II was sanctioned in Railway Budget 2008-09. The present cost of the project is ₹8,087 crore. The project is bifurcated into MUTP 2A and 2B as follows:

1.3.1 MUTP 2A – Completed : Cost ₹4,803 crore. Loan from World Bank ₹1,727 crore.

SN	Name of Work	Executing Agency	Status
1	EMU Procurement/Manufacture (ICF)	MRVC/RDSO/ICF	Completed
2	1500v DC to 25kV AC Conversion	CR, MRVC	Completed
3	EMU Maintenance Facilities & Stabling Lines	CR, WR, MRVC	Completed
4	Trespass Control measures	MRVC	Completed

1.3.2 MUTP 2B – In progress : (funded by GoM and MoR on 50:50 basis)

SN	Name of Work	Executing Agency	Completion Target / Status
1	Extension of Harbour Line between Andheri-Goregaon	MRVC	Completed in December, 2017
2	5 th and 6 th lines between Thane-Diva	MRVC	Completed in February, 2022
3	5 th and 6 th lines between CSTM-Kurla	CR	March, 2025
4	6 th Line between BCT-Borivali	WR	March, 2025
6	Resettlement and Rehabilitation	MMRDA	Along with project

1.4 Overall Amenities at various Stations by MRVC under MUTP II works

Under various MUTP II works, following amenities were provided in Mumbai suburban stations –

New FOBs	- 30	New platforms	- 12
Booking offices	- 27	New home platforms	- 02
Elevated Decks	- 06	Escalators	- 44
Platform extensions	- 31	Elevators	- 25
New Station (Ram Mandir Rd)	- 01	Skywalk/Highwalk	- 06

1.5 MUTP 2C – Running of 12 car on Harbour line - Completed: Cost ₹714 Crore.

All infrastructure works were completed in March, 2016. 13/12 car EMU rakes under the project were received in February, 2018. The project has led to increase in capacity by 33% on harbour line.

1.6 MUTP III – Sanctioned in December, 2016 – Cost of ₹10,947 crore.

SN	Name of the work	Cost (₹ in crore.)
1	New Suburban Railway Corridor Panvel-Karjat (double line) (28 Kms)	2,782
2	New Suburban corridor link between Airoli-Kalwa (elevated) on Central Railway (4 Kms)	476
3	Quadrupling of the Virar-Dahanu Road on Western Railway (31.5 Kms)	3,578
4	Procurement of Rolling Stock (565 coaches)	3,491
5	Trespass Control on mid-section	551

1.6.1 Land Acquisition for all corridors is in advance stage of completion and tenders have been awarded for a number of major works. Loan Agreement has been signed by Govt. of India and Asian Infrastructure Investment Bank (AIIB) on 24.08.2020, of ₹3500 crore (USD 500 million) for MUTP III.

1.7 MUTP IIIA - Sanctioned in April, 2019 - Cost of ₹33,690 crore.

SN	Name of the work	Cost (₹in crore.)	Executing Agency
1	Extension of Harbour Line between Goregaon-Borivali (7 rkm)	826	Western Railway
2	5th & 6th line between Borivali-Virar (26 rkm)	2,184	MRVC
3	4th line between Kalyan-Asangaon (32 rkm)	1,759	Central Railway
4	3rd & 4th line between Kalyan-Badlapur (15 rkm)	1,510	MRVC
5	Kalyan Yard - Segregation of Long distance and Suburban Traffic	866	Central Railway
6	a) CBTC on CSMT-Panvel on Harbour Line and Trans Harbour	1,391	MRVC
	b) CBTC on CSMT-Kalyan on Central Railway	2,166	MRVC
	c) CBTC on CCG-VR on Western Railway	2,371	MRVC
7	Station Improvement – at 19 stations	947	MRVC
8	Procurement of Rolling Stock - 191 AC EMU rakes	15,802	MRVC/ICF/MCF
9	Maintenance facilities for Rolling Stock	2,353	MRVC
10	Stabling Lines	557	CR & WR
11	Augmentation of Power Supply Arrangement	708	CR & WR
12	Technical Assistance	250	MRVC
	Grand Total	33,690	

Preliminary works are in progress.

1.8 Construction of FOBs on Central and Western Railway

Railway Board has entrusted MRVC the work of construction of FOBs on Central Railway and Western Railway stations of Mumbai Suburban Section in November, 2017. Out of total 31 FOBs, 7 FOBs are completed on CR and 16 FOBs completed on WR.

Braithwaite & Co. Limited

Braithwaite & Co. Limited (BCL) is a leading Heavy Engineering CPSE under Ministry of Railways, being conferred Miniratna-I status. It has 2 manufacturing units located in West Bengal and various project sites across India. BCL has been a dominant player in Railway Rolling Stock Industry in India, especially wagon Manufacturing, since decades. Its major products include manufacturing of newly built wagons & repairing of wagons, container manufacturing, operation & maintenance of Railway workshop, manufacturing of cranes, wagon sub-assemblies etc.

Recently, BCL's business has diversified to encompass service sector under its domain of operation, by entry into civil construction sector like that

of buildings, Railway bridges, Industrial cluster, structure for oil refinery etc.; Renewable energy sector like erection of solar PV plants, AMC services sector like that of Heavy-duty cranes, Railway Station development and skill development sector by operating Welding Training Institutes. The Company is accredited with relevant international standards : ISO 9001:2015,ISO 45001:2018, ISO 14001:2015, ISO 3834-2:2005, EN ISO 3834-2: 2005 and EN 15085-2:2007.

Highlights of its performance in the FY 2021-22, vis-à-vis the same for FY 2020-21 are tabulated below:

Particulars	2020-21	2021-22	% increase
Revenue from Operations (₹ crore)	609.60	764.14	25.35%
Profit before Tax (₹ crore)	31.07	46.43	49.43%
Net Worth (₹crore)	108.17	150.59	39.21%
New Wagon (Nos)	1,023	1,201	17.40%
Repair Wagon incl. O & M of Vadlapudi Rly Workshop (₹crore)	188.16	251.95	33.90%
Bogie (Nos)	1,463	1,673	14.35%

Major Achievements during 2021-22, the performance of BCL:

- As enumerated above, BCL is continuing its journey of surpassing the previous year's achievements, recorded highest ever Sales, PBT & Net Worth.
- Secured Order of more than ₹1000 crore. during the year, thus achieving highest ever Order Book position of ₹2058 crore., the portfolio including orders from the Private Sector as well as in various business verticals.
- BCL has successfully developed the following new design wagons – BOBSNS, BCFCM and RORO wagon.
- DPE had rated the Company 'Excellent' for performance of MoU 2020-21. Based on Self-evaluation of performance, Company is likely to score "Excellent" in the MoU 2021-22 too.
- The Credit Rating of the Company upgraded five times to 'A', the latest being in March, 2022.

Self – Sufficiency

Stores imported by IR constitute 1.35% of the total stores purchased. The cost of stores imported in the last three years are as under:

Item	2019-20	2020-21	(₹ in crore)
			2021-22
Diesel loco parts and fittings	225.18	71.93	58.10
Electric loco parts and fittings	207.61	147.10	76.33
Carriage, Wagon and EMU parts and fittings	141.81	190.93	132.81
Electrical stores	25.45	0.47	2.49
Engineering stores	54.40	0.48	42.31
Ball and Roller Bearings	0.37	-	0.14
General stores covering acids, chemicals, drugs, etc.	41.41	30.12	22.24
Other items including metal ferrous, complete units of rolling stock i.e. bogies, wheel -sets, couplers, etc.	93.90	11.70	334.42
Grand Total	790.13	452.73	658.87

Strategy for Self-Sufficiency:

Steps have been taken by Indian Railways in developing indigenous sources in the country for the items presently being imported. Simultaneously, adequate capacity has been developed for manufacturing a range of components in workshops owned by IR as well as in public/private sector units with indigenous designs and competency.

The import content of raw material/components, in terms of percentage of total production cost (excluding Proforma charges) for different types of Rolling Stock manufactured in Indian Railway Production Units for the year 2021-22 is furnished below:

LOCOMOTIVES/COACHES		2020-21	2021-22
BLW	WAP-7	1.08	1.26
	WAG-9H	1.63	0.51
	Diesel Loco (Mozambique Loco)	-	1.16
	WDG-3A	4.5	-
	WDS-6	4.5	-
RCF	LGS	0.87	0.94
	LSLRD(LC)	0.82	0.90
	EOG/LHB/FAC	0.72	0.72
	SCZAC/EOG/LHB	0.74	0.76
	VPHX	1.17	1.22

	LOCOMOTIVES/COACHES	2020-21	2021-22
	LWSCZ	0.92	0.93
	LWSCN	0.91	0.91
	LFCWAC	0.72	-
	ACCB/EOG/LHB	0.72	0.74
	WLRRM/EOG/LHB	0.51	-
	ACCW/EOG/LHB	0.69	0.78
	LACCNX	0.70	0.74
	3 PH MEMU TC	1.11	-
	LWSCN (COIL SPRING)	0.89	-
	LWACCN (GARIB RATH)	0.71	0.81
	LWLRRM (LOW NOISE)	0.71	-
	LRM500SX	-	0.64
CLW	WAG-9	1.20	0.35
	WAP-7	1.34	0.81
	WAP-5	3.20	2.84
MCF	LWFAC	1.78	1.63
	LWLRRM DAC	1.36	-
	LWCBAC/T	1.61	1.47
	LWFAC/T	1.49	1.36
	LWACCN/T	1.43	1.31
	LWACCW/T(2AC)	1.43	1.31
	LWACCW (2AC)	1.76	1.76
	LWFCWAC	2.07	1.61
	LWACCN	1.86	1.79
	LWCBAC	1.68	1.64
	LWSCZAC	1.84	-
	HUMSAFAR	1.57	-
	LSLRD	1.81	1.83
	LWSCN(G)	2.27	2.08
	LWS DEEN	2.22	2.14
	LWSCZ	2.33	2.14
	LWSCN	2.23	2.05
	BRAK VAN/T (LWLRRM/T)	1.44	1.13
	LWLRRM	1.36	1.22
	PARCEL VAN	-	3.56
ICF	LSDD	-	1.05
	LACCN	2.6	0.98
	LWACCN E	-	0.82
	LACCW	2.95	1.05
	LACCW LW	-	0.97
	LFCWAC	1.71	1.11
	LS	2.52	-
	LSCN	2.28	2.19

LOCOMOTIVES/COACHES	2020-21	2021-22
LSLRD (with DA SET)	0.81	-
LSLRD (w/o DA SET)	1.54	-
LWFCZAC	1.4	-
LSLRD	-	0.97
LPV	-	1.35
LSCZ	-	1.24
LSCZ AC	1.6	1.04
LRAAC	-	0.67
VISTADOME	-	0.62
LWCB AC	2.55	0.98
LFAC	-	1.06
LWFAC	1.7	-
LWLRRM	1.63	-

Locomotives:

Locomotives are manufactured by Chittaranjan Locomotive Works (CLW), Chittaranjan, Banaras Locomotive Works (BLW), Varanasi and Patiala Locomotive Works (PLW), Patiala. During 2021-22, CLW manufactured 486 state-of-the-art HHP BG electric locomotives. BLW manufactured 367 BG locomotives including 4 Diesel Locomotives for NRC/Export. PLW manufactures 116 nos HHP Electric locomotives.

PLW, Patiala also manufactures 81 nos. DETC Tower cars along with diesel and electric loco spares parts for Zonal Railways.

Passenger Service Vehicles:

During 2021-22, Integral Coach Factory (ICF), Chennai manufactured 3,101 coaches (248 three phase MEMUs, 18 high speed Self Propelled Accident Relief Trains (SPART), 32 coaches for Kolkata Metro, 2,639 LHB coaches, 55 nos (DETC) /inspection cars and 109 coaches for Sri Lankan Railways). Rail Coach Factory (RCF), Kapurthala manufactured 1,862 coaches (1,840 LHB coaches, 22 MEMU coaches). Modern Coach Factory (MCF), Raebareli manufactured 1,875 LHB coaches including 63 coaches for Mozambique Railway.

Wheels and Axles:

RWF, Bangaluru manufactured 1,22,725 wheel, 86,272 (units) axles and 48,883 wheel-sets and Rail Wheel Plant (RWP), Bela manufactured 23,051 wheels during 2021-22.

Wagons:

Indian Railways' bulk requirement of wagons is met by wagon

manufacturing units both in public and private sectors as well as PSUs under the administrative control of Ministry of Railways.

During the year 2021-22, 12,796 wagons were inducted in Indian Railway System. Out of these, 1,292 wagons (including 710 BLC wagons) were manufactured by Railway Workshops and the remaining 11,504 wagons (including 513 BLC wagons) were manufactured by wagon industry.

Signalling:

Railway Signaling installations use a number of specialized equipment for smooth & safe running of trains. With upgradation of technology and shift towards electrical/electronic system of Signaling, the demand for these equipments has gone up. To attain self-sufficiency in meeting this increased demand, IR’s Signal Workshops at Podanur on Southern Railway, Mettuguda on South Central Railway, Gorakhpur on North Eastern Railway, Howrah on Eastern Railway, Byculla on Central Railway, Sabarmati on Western Railway, Ajmer on North Western Railway, Kharagpur on South Eastern Railway and Ghaziabad on Northern Railway have been manufacturing items like Electric Point Machines, Tokenless Block Instrument, Double Line Block Instruments, Axle Counters, various types of Relays, etc. Year wise out-turn achieved by these S&T workshops are as under:

Year wise out - turn of Signal and Telecommunication Workshop:

Year	Out - Turn in Lakhs
2019-20	32,385.90
2020-21	25,041.89
2021-22	31,300

Traction Motor Shops:

IR has in-house facility for rewinding, repairing and re-shafting of traction motors of conventional electric locomotives and EMU/MEMU at its workshops at Nasik Road, Kanpur, Tatanagar and Kancharapara. Work of rewinding, repairing and re-shafting of traction motors of ‘state-of-the-art’ three phase electric locomotives is being carried out in Traction Motor Shop, Nasik Road and Tatanagar.

These workshops have the annual capacity of 3000 traction motor rewinding/repair/re-shafting including ‘state-of-the-art’ traction motors of three phase electric locomotives & EMU/MEMUs.

Materials Management

Materials Management Department deals with planning, organising, communicating, directing and controlling of all the activities concerned with the flow of materials into an organization and its further movement to various users. Indian Railways is one of the largest organizations in the country dealing with public procurement.

Expenditure on Purchases

Expenditure by Indian Railways on procurement of goods to meet the requirements of operation, maintenance and production of assets (excluding track related items and goods supplied as part of works) during 2021-22 was ₹48,713.77 crore.

A broad classification of procurement of such goods is given below:-

	2020-21	(₹ in crore) 2021-22
Stores for operation, repairs and maintenance	11,542.48	12,527.08
Stores for construction	2,374.81	3,345.50
Fuel	7,284.86	10,362.24
Stores for manufacture of Rolling Stock and purchase of Complete units	28,890.30	22,478.95
Total	50,092.45	48,713.77

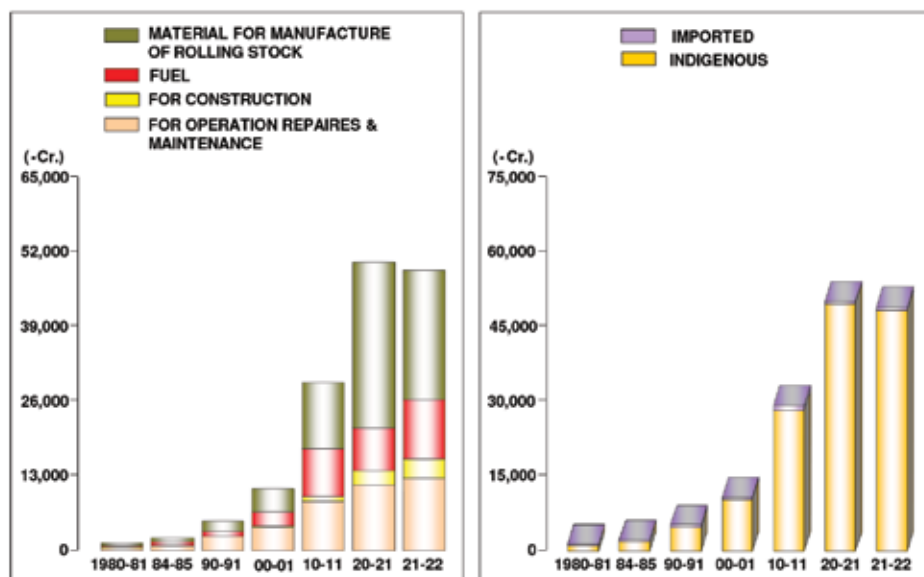
Stocking Depots

Warehouse management is an important aspect of materials management. Indian Railways has extensive warehouse network dedicated to provide the required material close to the point of consumption as efficiently as possible. To meet this requirement, Zonal Railways and Production Units have 306 stocking depots spread all over the Railway Network. These depots stock over 2.42 lakh items consisting of raw materials, components, spares, consumables etc.

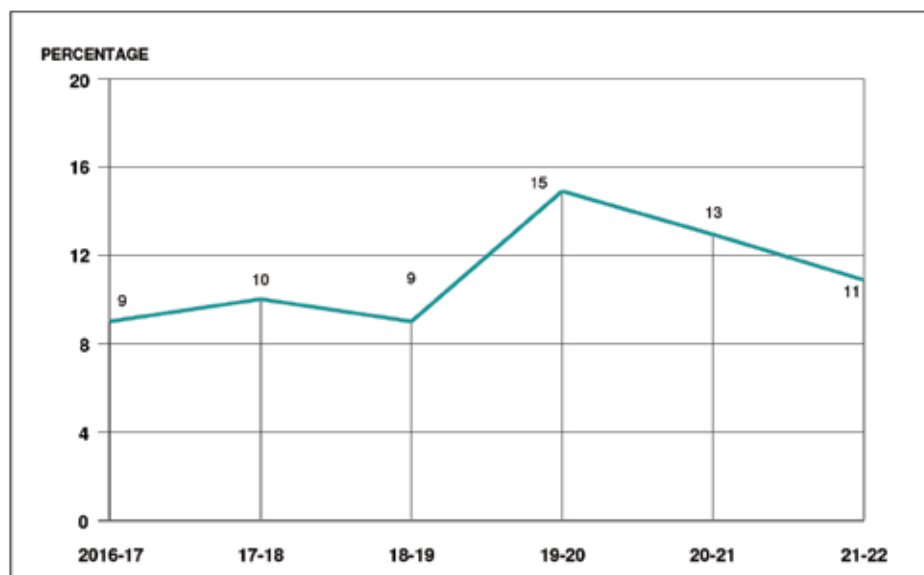
Disposal of unserviceable Items

Efficient Materials Management also involves timely and efficient disposal of scrap generated during maintenance and production activities. Safe disposal of industrial waste and hazardous scrap is a legal obligation which is meticulously ensured by Indian Railways. Disposal of obsolete items is essential to free the locked up capital in such assets. Disposal of scrap

VALUE OF STORES PURCHASED



INVENTORY TURNOVER RATIO (EXCLUDING FUEL)



is an important source of revenue for Railways. Total revenue generated through disposal of scrap, during 2021-22, was ₹5,316.24 crore, as against ₹4,575.29 crore during 2020-21.

Digitisation

Digitization of Materials Management functions over Indian Railways humbly started with e-tendering and e-auction on Indian Railway E-Procurement System (IREPS) platform has transformed into digital supply chain with single window solution for all stakeholders. It is developed on the underlying concept of Transparency, Efficiency and Ease of Doing Business. System has paperless process capabilities and all the processes of IR's Supply Chain as well as scrap disposal are in digital mode. With the implementation of User Depot Module (UDM) of IMMS, digitization of entire supply chain up to last mile i.e. at user end is being envisaged.

Key initiatives during the year:

- Unified Vendor Approval Module (UVAM) of IREPS, launched in May'2021, is another digital initiative by Railways which has digitized all stages and activities of vendor approval, by Railways' vendor approving units through a single portal. All the stages of vendor approval and communication with the applicant vendors including payment of application fee are online.
- Digitisation of bills for non-stock items – Digital submission and processing of vendors' bills for stock items has already been implemented way back. In August'2021, Railways has launched online submission and processing of vendors' bills for non-stock items as well.

IMMS, UDM and UVAM along with IREPS, has made it possible to realise the goal of Indian Railways to completely digitize the supply chain.

Agency of Procurement

Zonal Railways and Production Units mostly procure the materials required by them in a decentralised system, but for purchase of a few items which are centralised for procurement at Railway Board's level. Common use Goods and Services available on GeM are reserved for procurement through GeM portal. Out of ₹48,713.77 crore worth of stores procured in 2021-22, 78% was done by Zonal Railways and Production Units, 22% by Railway Board.

Stores worth ₹7,068.82 crore were bought from Small Scale Sector and Khadi and Village Industries in 2021-22.

Public Sector Undertakings contributed 14% and other industries contributed 86% towards supplies.

Indigenous Vendor Development

Indian Railways has fully implemented Public Procurement (Preference to Make in India) Order. The value of Indigenous stores at ₹48,054.90 crore during 2021-22 constituted almost 99% of the total purchases by Indian Railways. Indian Railway has to depend on imports for high technology components for its locomotives, coaches, signal & telecom equipments etc. which are not available in adequate quantity with required quality within the country.

Inventories

Maintaining inventories at an optimum level is the key to successful materials management. Turn Over Ratio for the year 2021-22 was 11% (without fuel) and 8% (with fuel), as against 13% (without fuel) and 12% (with fuel) during 2020-21.

Wagons and Steel Procurement

During the year 2021-22, 12,796 wagons were inducted in Indian Railway System. Out of these, 1292 wagons (including 710 BLC wagons) were manufactured by Railway Workshops and the remaining 11504 wagons (including 513 BLC wagons) were manufactured by wagon industry. Procurement of iron and steel material, during 2021-22, was 99,731 MT (valued ₹616.1crore) as against 64,700 MT (valued ₹340 crore) during 2020-21.

Printing and Stationery

Five General Printing Presses and attached 'Book and Forms Depots' on Indian Railways, meet the entire requirements of money value items, PRS, UTS Ticket Rolls for Passenger trains of Indian Railways.

Five General Printing Presses produced an out-turn of 4.0 crore A-2 standard size impressions in 2021-22. The availability of vital money value items like Parcel Way Bill, Railway Receipt, Excess Fare Tickets, Luggage Tickets, Blank Paper Tickets etc., has been ensured throughout the year across all Zonal Railways.

The Book and Forms Depots stocked 1770 different items. Transactions of receipts and issues at these depots were worth of ₹24.64 and ₹22.82 crore respectively in 2021-22.

Security

The Railway Protection Force (RPF) has been constituted under the RPF Act, 1957 (as amended in the year 1985 and 2003) for better protection and security of railway property, passenger area, passengers and matters connected therewith. RPF is headed by an officer of the rank of Director General, who functions under the Ministry of Railways.

RPF is empowered under the 'Railway Property (Unlawful Possession) Act, 1966' to deal with cases of theft, dishonest misappropriation and unlawful possession of railway property. RPF is also empowered under the Railways Act, 1989 to deal with offences related to roof traveling, toutting, unauthorized entry into coaches earmarked for ladies, unauthorized vending, trespassing, etc. Further ambit of powers of RPF has been enhanced by the Central Government to exercise the powers and perform the specified duties under sections 42 and 67 of "The Narcotic Drugs and Psychotropic Substances Act, 1985" and under section 25 of "The Cigarettes and other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003" within the areas of their respective jurisdiction respectively.

The administrative set-up of the Railway Protection Force is in sync with the administrative set-up of the Indian Railways. In addition, a special formation called Railway Protection Special Force (RPSF), which is organized on Battalion pattern, provides specialized service to assist the RPF in zonal railways. At present, there are 15 battalions of RPSF located in various parts of the country, including one Mahila Battalion and one Commando battalion (CORAS).

Separate specialized intelligence units, viz. Special Intelligence Branch (SIB) and Crime Intelligence Branch (CIB) also function at Divisional as well as Zonal Railways for collection of special and criminal intelligence respectively. Besides above, Stores, Dog Squad and Band are other specialized units of the Force and located at Divisional, Battalion and Zonal levels, as per requirements of the Force.

On 14.08.2019, Hon'ble Minister of Railways inducted the first Commando force for railways: CORAS (Commandos for Railway Security). Comprising RPF and RPSF personnel, the CORAS is armed with special uniforms with bullet-proof jackets, helmets and sophisticated weapons. CORAS commandos have undergone training programmes, including basic and advanced commando courses with specialization in handling landmines and improvised explosive devices, hostage rescue, sniping and breaching.

The unit is being envisaged as a responder for any situation pertaining to damage, disturbance, disruption of train operations, attack/hostage/hijack, and disaster situations in railway areas. 'Police' and 'Public Order' are State subjects under the Seventh Schedule to the Constitution of India and, therefore, State Governments are responsible for prevention, detection, registration and investigation of crime and maintenance of law and order on Railways through their law enforcement agencies viz. Government Railway Police (GRP)/District Police. Railway Protection Force (RPF) supplements the efforts of GRP/District Police to provide better protection and security to railway property, passenger area and passengers and for matters connected therewith. Cases of damage, destruction of government property including railway property are registered and investigated by the concerned GRP/State Police under IPC & Railways Act.

However, the administrative expenses incurred on GRP are shared by Central Government and State Government.

Round the clock security related assistance to passengers by RPF

- **Railway Helpline-** Train Passengers can seek assistance by making calls/complaints on Rail Madad Portal directly or through Helpline Number 139 (integrated with National Emergency no. 112). Their concern are addressed on urgent basis and necessary action/assistance is provided to them.
- **Twitter-** Complaints/suggestions, relating to Security, received through MR Twitter handle @RailMinIndia and @RailwaySeva, are swiftly attended and necessary follow-up action is initiated.

Details of complaints attended over Twitter and Helpline No. :

Year	No. of complaints attended on Twitter	No. of complaints attended on Help Line No.
2020*	9,062	13,922
2021	14,917	49,996
2022 (Upto July)	13,524	73,946
* revised		

Efforts made to strengthen Railway Security

In order to provide safe and secure journey to train passengers, surveillance is kept through CCTV cameras provided at 861 stations and in 5882 coaches. To provide security & facilitation to Railway passengers, various initiatives have been undertaken to boost the confidence & sense of security among all stake holders of Indian Railways including passengers by Team RPF. RPF is performing duties and responsibilities entrusted with full dedication and commitment all over India.

- a) **Operation “Nanhe Faristey” (Rescue of children):** RPF undertakes the noble cause of identifying and rescuing children in need of care & protection who are lost/separated from their family due to various reasons. A revised Standard Operating Procedure (SOP) for the Railways 2021 to ensure care and protection of children in contact with Railways has been issued on 23.12.2021 incorporating all existing guidelines/directions etc. In accordance with provisions of SOP Child Help Groups (CHGs) also have been constituted at these stations which comprise of Station Superintendent/Station Master/Station Director/Station Manager, Inspector/RPF, SHO/GRP, Chief Ticket Inspector and Sr. Section Engineer. Ministry of Women and Child Development has nominated NGOs at these stations.

Details of children rescued by RPF in the year 2020, 2021 & 2022 (upto July):

Year	No. of children rescued by RPF
2020	5,011*
2021	11,907
2022 (Upto July)	10,454

*revised

- b) **Operation ‘Yatri Suraksha’** - RPF provides special attention towards the security and safe travel of passengers through the railways. RPF is also available on call (Railway helpline 139 and other social media forums i.e. Twitter, Facebook, Instagram etc.) round the clock to receive and resolve security and other grievances of passengers. Team RPF has arrested 5803 criminals and handed over them to concerned GRPs for further legal action during the year 2021 & 2022 (upto July). Team RPF has also assisted 1,77,081 passengers in distress related to security under operation Yatri Suraksha.

Year	No. of IPC Cases detected	No. of person arrested
2021	2,577	3,061
2022 (upto July)	2,566	2,742

- c) **Operation “Amanat”** - RPF personnel helps in securing of passenger’s belongings who forget in a rush to board the train or leave the train/station. Team RPF has detected following 25,966 cases of left behind passenger’s luggages in 2021 & 2022 (upto July) where value of recovered luggage stands at about ₹48.1 crore (approx.) handed over to the passengers under operation Amanat.

Year	Retrieval of left behind luggage	Value of property recovered (₹ in crore)
2021	12,377	23.43
2022 (upto July)	13,589	24.63

- d) Operation “Jeevan Raksha”:** Life of 593 male and 462 female passengers were saved due to alertness and swift action by Team RPF in platforms, railway track and trains in the year 2021 & 2022 (upto July) under operation Jeevan Raksha wherein passenger in hurry try to board/de-board a moving train, slip and fall with the risk of coming under the wheels of train or try to commit suicide by deliberately coming in front of a running train.

Year	Saving life and efforts to reduce deaths on track	
	Male	Female
2021	332	269
2022 (upto July)	261	193

- e) Operation “Sewa” -** RPF personnel assists the elderly citizens, women physically disabled and sick/injured persons in their travel through trains and services associated therewith i.e providing other amenities like Wheel Chairs, Stretcher, medical help, providing ambulance, medicine and infant food etc. Team RPF has assisted 10701 persons (elderly/ women/ divyangjan/ sick/ injured/ infants) during their travel in boarding & de-boarding and availing/providing other amenities during the year 2022 (upto July) under operation Sewa.

Year	No. of persons (Elderly/Women/Divyangjan/ Sick/Injured/Infants) assisted by RPF
2022 (upto July)	10,701

- f) Operation “Matrishakti” -** RPF personnel especially ladies RPF personnel currently 9% of the total strength of RPF, go out of the way to help pregnant women who go into labor during their train journey or in Railway premise in child birth. Team RPF has assisted 56 pregnant women in train and 25 women in railway premise in child birth under operation Matrishakti.

Year	No. of cases attended and assistance provided in child birth	
	In Train	In premises
2022 (upto July)	56	25

- g) Operation “AAHT” (Action Against Human Trafficking):** The RPF has signed an MoU with Nobel laureate Kailash Satyarthi’s Children Foundation (The Association for Voluntary Action) which is also known by the name Bachpan Bachao Andolan to work on the project to end human trafficking through railways in the country, working effectively under railways. Team RPF has rescued 312 children and 30 adults who were being trafficked through railway system in 2022 (upto July).

Year	No. of Trafficked Persons rescued				No. of traffickers arrested
	Juvenile		Adult		
	Boys	Girls	Male	Female	
2021	401	94	81	54	-
2022 (upto July)	260	52	18	12	116

h) Operation “Uplabdh”: Procurement of railway tickets for reserved accommodation has been a very tough task for the common man as they were being cornering confirmed railway reservations online has adversely affected the availability of confirmed tickets to the common man. RPF has been undertaking intensive and continuous action against persons involved in toutting (unauthorized carrying of business of procuring & supply of railway tickets). Similarly in the endeavour to enhance the feeling of security to travelling passengers, action is taken against unauthorized and against towel spreaders preventing entry of authorized passengers under operation Uplabdh. Regular drives are conducted by Team RPF against touts over Indian Railway and action is taken against persons found involved in as per extant legal provisions. Actions under relevant legal provisions were taken by Team RPF in such cases. During action against touts, more than 140 illegal softwares were disrupted with arrest of 583 persons involved in operation of these softwares since 2019 till 2022(July).

(i) Action against towel spreaders/Unauthorized entry/Resisting entry of authorized entry

Year	Case registered u/s 155 Rly Act	Person arrested	Amount of fine released
2022 (upto July)	16,302	16,688	₹ 35.42 lakh

(ii) Action for procuring of illegal tickets.

Year	No. of cases registered	No. of person arrested	No. of ticket seized		Value of ticket seized (₹ in crore)		No. of IRCTC user IDs blocked
			Future journey (in lakh)	Past journey (₹in lakh)	Future journey	Past journey	
2021	4,151	4,617	5.6	6.55	2.83	17.32	27,969
2022 (upto July)	3,210	2,416	1.13	3.38	1.87	11.81	17,159

(iii) Action against persons unauthorized occupied travel space in coaches reserved for passengers with disabilities.

Year	No. of case registered	No. of person arrested
2021	9,006	9,307
2022 (upto July)	21,842	21,913

i) Operation “Rail Suraksha” - RPF has been mandated for protection & security of Railway Property. In this mission RPF is putting their best in protecting and safeguarding the Railway property including property

booked through the Railways from the criminals. RPF is prosecuting offenders under relevant provisions of the 'Railway Property (Unlawful Possession) Act, 1966' for unlawful possession of the railway property since the year 1966. This Act was amended in the year 2012, with widening of the ambit of penal sections. Team RPF arrested 16,485 accused with recovery of stolen railway property worth ₹14.22 crores (approx.) during the year 2020 to 2022 (upto July).

Booked consignment + Railway Material

Year	No. of case registered	Value of Property recovered (₹ in crore)	No. of person arrested
2021	4,716	5.16	7,018
2022 (upto July)	3,573	3.21	5,096

- j) **Operation Satark:** Transportation by trains has become a major conduit for tax evaders/law breakers. This operation is aimed to assist other LEAs in their work under which RPF makes/assist them in recovery of Tobacco product, liquor product, recovery of FICN/ Unaccounted gold/unaccounted cash/Unaccounted other precious metal/smuggled goods/ Arms & Ammunitions/ explosives and recovery of bank medicines. Team RPF has detected 6543 cases and 3303 accused were arrested with recovery of Tobacco products and other items value of ₹72.59 crore during the year 2021 to 2022 (upto July) under operation Satark.

Year	Tobacco Product			Liquor Product			Recovery of FICN/ Unaccounted gold /Cash / Other Smuggled Goods etc.		
	Case detected	Value (₹ in crore)	Person arrested	Case detected	Value (₹ in crore)	Person arrested	Case detected	Value (₹ in crore)	Person arrested
2021	2258	8.98	837	2059	2.38	1084	-	-	-
2022 (upto July)	484	4.17	321	1591	1.91	873	151	55.13	188

- k) **Operation 'Dusra':** Railway premises at remote location and trains are vulnerable to activity of unauthorized vending/hawking through selling of eatables. This poses high risk of food adulteration and poor quality of food to passengers. This operation is launched for acting against the menace of unauthorized hawking and vending in Railway premises and in trains. Team RPF has registered 109201 cases and 110093 accused were arrested during the year 2022 (upto July) under operation Dusra.

Drive against unauthorized Vendors/Hawkers in Trains/Passenger Area (u/s 144 Rly Act.)

Year	No. of case registered	No. of person arrested
2022 (upto July)	1.09 lakh	1.1 lakh

- l) Operation “NARCOS”:** Narcotics do not only destroy the health of the youth, but they also damage the economy and wellbeing of the nation too. RPF has been empowered to conduct search, seizure, and arrest under NDPS Act in 2019. In order to give focused attention to drive against smuggling of Narcotics through rail, RPF has launched operation NARCOS. Team RPF has detected 1747 cases and 1325 accused were arrested with recover of illicit items value ₹20.16 crore during the year 2021 to 2022 (upto July) under operation NARCOS.

Recovery of NDPS

Year	No. of case detected	Value of NDPS recovered (₹ in crore)	No. of person arrested
2021	738	15.72	620
2022 (upto July)	1009	4.43	705

- m) Operation ‘WILEP’ :** Smuggling of Wildlife, animal parts and forest product is crime against nature. Team RPF has been alive to the issue and has taken stringent action under this operation against the smuggler involved in illegal trade of wildlife through railways. Team RPF has detected 49 cases and 32 accused were arrested during the year 2022 (upto July) under operation WILEP.

Year	No. of case detected		Description of wild life seized with quantity		No. of person arrested
	Fauna	Floara	Fauna	Floara	
2022 (upto July)	49	32	202	0	52

Special efforts are made to enhance women security under operation Mahila Suraksha :

- Under ‘Meri Saheli’ initiative, focused attention has been provided for Safety and Security of lady passengers travelling alone by long distance trains for their entire journey i.e. from originating station to destination station.
- Zonal Railways are instructed for deployment of proper combined strength of male & female RPF/RPSF personnel in train escort parties, to the extent possible.
- Ladies Special trains running in Metropolitan cities are being escorted by lady RPF personnel. In other trains, where escorts are provided, the train escorting parties have been briefed to keep extra vigil on the lady passengers travelling alone, ladies coaches en-route and at halting stations.
- Frequent Drives are conducted against entry of male passengers into the compartments reserved for ladies.

Vigilance

Vigilance Organization plays a very important role in the administration of the Railways. It investigates complaints, conducts sample checks in respect of managerial decisions, with a view to determine their conformity to objectivity, transparency and concordance with extant rules and procedures.

Vigilance working has four facets: (i) Preventive Vigilance (ii) Participative Vigilance (iii) Punitive Vigilance and (iv) Pro-active Vigilance.

Preventive Vigilance:

The aim here is to disseminate knowledge across a wide cross section of Railway officials, suggest system rationalization measures for imparting greater transparency and predictability catalyze use of technology in decision making and create greater awareness amongst the public on issues relating to corruption mitigation.

Some of the steps taken in this direction during the year 2021-22 were:

- A total of 11,946 preventive checks were conducted throughout the Railways.
- All major Railway Units released E-magazines/Bulletins for circulation. These bulletins contain case studies, dos & don't etc. related to various departments.
- Electronic media was extensively utilized by all Zonal Railways, Production Units and Public Sector for conducting extensive public campaigns during Vigilance Awareness Week, 2021.

Participative Vigilance:

- **24 Hours Vigilance Helpline:** 24 hour vigilance helpline (Helpline No.139) of the Railways. In addition to this, the email addresses of vigilance officers are posted on the website.
- **Vigilance Awareness Week** is celebrated every year during the last week of October or first week of November to educate the general public regarding the facilities available in the department and also ways and means to lodge complaints. The same was observed between 26th October and 01st November in the year 2021.

- **Counselling:** As many as 252 Workshops/webinars/ interactive sessions were conducted on topical issues by Vigilance in 2020 in which Officers, senior supervisors and other railway personnel representing various levels and disciplines participated; the primary focus was to inculcate greater awareness of rules, procedures and, most importantly, the pitfalls that need to be steered clear of.

In the training programme that is conducted annually for Vigilance Inspectors and Investigating Inspectors at the Diesel Loco Shed/Tughlakabad, a total of 141 personnel participated scheduled from 06th-10th September, 2021.

Punitive Vigilance

A statement showing number of officials against whom disciplinary action in vigilance-investigated cases was initiated/finalized during April 2021 to March 2022 is given below:

Vigilance investigated cases	2021-22
Number of officials against whom disciplinary proceedings were initiated.	2,730
Number of officials against whom disciplinary proceedings resulted in imposition of major penalty.	756
Number of officials against whom disciplinary proceedings resulted in imposition of minor penalty.	2,702

Proactive Vigilance:

- Conducting surprise checks in areas of mass contact (like reservation offices, ticket booking counters, luggage/parcel and goods booking offices, on-board passenger-carrying trains etc.) in the accountal/disposal of scrap, loading of freight wagons and parcel vans (primarily with a view to detect/control incidences of overloading) etc. During the calendar year 2021, these measures resulted in realization of revenues to the tune of ₹98.03 crore.
- Scrutinizing of more than 4,097 Annual Property Returns filed by Officers.

Preserving Indian Railways Heritage

Preservation of Railway Heritage and unlocking its potential for significant and meaningful contributions to India's knowledge society shall remain one of the prime social responsibilities of Indian Railways and its associated Public Sector Undertakings.

A slew of measures to institutionalize rail heritage preservation include compilation and digitization of heritage inventory, collaboration with institutions and stakeholders, capacity building of railway officers and introducing modules for training courses. Zonal Railways have carried forward interesting projects related to heritage. Kalinga Rail Museum/East Coast Railway was inaugurated on 30th October 2021 at Bhubaneswar to preserve rich heritage of East Coast Railway. Rail Museum at Ajmer/North Western Railway has been started with full swing on 25th July 2021 with one steam engine, diesel locomotive & four stroke diesel engine working model and other rail heritage artifacts. A MoU between Northeast Frontier Railway and Himalayan Mountaineering Institute, Darjeeling signed on 12.04.2021. Northeast Frontier Railway provided one serviceable Bio-Toilet to Himalayan Mountaineering Institute for installation at their Institute located at a height of 6800 ft. HMI will extend training to Railway officials in mountaineering and agrees to include them in teams of mountaineering expeditions.

Azadi Ka Amrit Mahotsav - an initiative of the Government of India to commemorate 75 years of independence and the glorious history of its people, culture and achievements is being celebrated at National Rail Museum, Regional Rail Museums and other rail museums all over the Indian Railways through various exhibitions & events related to Mahatma Gandhi, Sardar Patel and other freedom fighters. National Rail Museum (NRM), New Delhi acquired Twin Car Presidential Saloon 9000-9001 from Delhi Division and it was exhibited as Star Exhibit in Outdoor area. DHR Loco No. 799 B was also added as another star exhibit in the outdoor area of NRM. E-picnic was organized for students of 11 schools from Delhi, Kolkata and Varanasi during the COVID pandemic at NRM. A total of 79 e-picnics have been organized in which more than 5000 students participated. On the occasion of Gandhi Jayanti, exhibition on "Gandhiji's imprint on Railways" was organized inside an EMU coach exhibit at NRM.

Indian Railways maintain a large repository of built heritage like buildings, bridges, viaducts etc. As of now, besides all bridges and tunnels on Kalka Shimla and Kangra Valley Section, about 45 bridges and tunnels, and 68 Heritage Structures/buildings and 72 Heritage stations are designated as Heritage Assets by Indian Railways. Notable among them are Jubilee Bridge near Kolkata, Yamuna Bridge near Naini, Sonenagar Bridge, Pamban viaduct, Bandra suburban station, Pratap Vilas Palace, Vadodara, Glenogle Bungalow, Mumbai, South Eastern Railway (erstwhile Bengal Nagpur Railway) Headquarter, Kolkata etc. The new “Chenab Bridge” is the latest in the series of iconic bridges, a part of the New Heritage connecting Jammu & Kashmir by rail. Indian Railways have been making special efforts to conserve these built heritages with inventories, documentation & policy initiatives. Association with Indian National Trust for Art & Cultural Heritage (INTACH), International Council on Monuments & Sites (ICOMOS), The International Committee for the Conservation of the Industrial Heritage (TICCIH) and International Centre for the Study of the Preservation & Restoration of Cultural Property (ICCROM) assist our endeavours. Training and capacity building in industrial heritage conservation is regularly arranged.

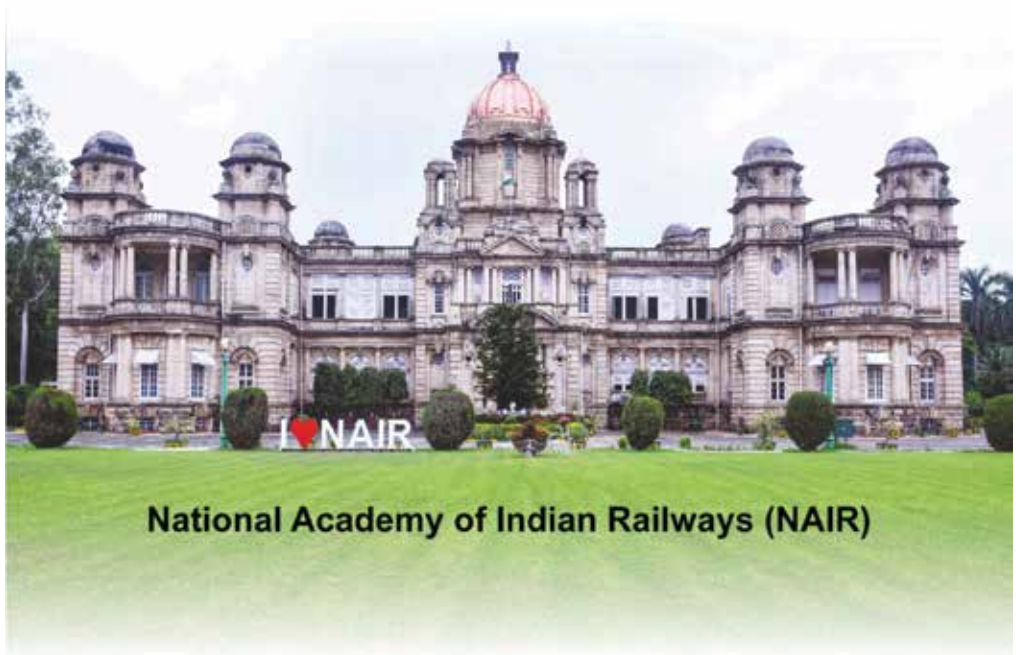
The Heritage Directorate in the Railway Board assists in framing policy related to the UNESCO World Heritage Sites of the Mountain Railways in Darjeeling, Shimla and the Nilgiris, and other built heritage sites across the Indian Railway network. The focus of heritage preservation has been balancing tourism with heritage and sustainable development. Efforts are centred around connecting communities along these linear routes, and ensuring their role as stakeholders in conservation. Heritage rolling stock assets, skills & their transmission are incorporated in an interconnected and dynamic continuity of heritage railways, over more than 150 years’ of operation. Truly a blend of Heritage & Modernity.

The chronicled narrative of the industrial heritage of a nation is a historical record of its technological move to modernity. The ‘intangible’ heritage of the Indian Railways showcased in the National Rail Museum in Chanakyapuri, New Delhi is a constant source of delight to railway enthusiasts. Regional Rail Museums in four major cities of Howrah, Chennai, Mysore & Nagpur are equally popular with visitors. Several prestigious and well-acclaimed Railway Heritage galleries across the national railway network stand testimony to the value attached to over 167 years of railway heritage. It is a strong way to reinforce the heritage branding of the organization and its associated entities of the sector.

Indian Railways have inventoried heritage rolling stock assets and also

preserved about 247 Steam Locomotives/engines, 223 vintage coaches and wagons and 134 Diesel and Electric vintage locomotives at prominent places including museums, heritage park etc., for public display. Many of these rolling stocks are more than 100 years old and include 40 Steam locomotives as working heritage. The Rewari Heritage Steam Centre maintains six Broad Gauge and four Meter Gauge working steam locomotives, including the iconic “Fairy Queen” (1855), placed in the Guinness Book of Records as being the oldest working locomotive in the World. Another proud possession is “Akbar” that featured in memorable Bollywood movies like Sultan & Gadar etc. Toy Trains and Exhibits (Locomotives/Coaches) have been sold or gifted as special heritage displays at various cities on request from State Governments/Public bodies.

Indian Railways’ mesmerizing journeys continue to be retold through the “Google Arts & Culture” platform. Additions to the platform with Sportspersons of Indian Railways, Railways and Rural Murals, Railway Bridges in Panoramic views, all extend the link of railway transportation to the retelling of touching, human stories through the massive reach of this online platform. The content is shared across other railway websites and social medial handles too.





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